A cross linguistic study on the acquisition of temporal reference systems; Thai, Lisu and English.

Winskel, Heather

A CROSS LINGUISTIC STUDY ON THE ACQUISITION OF TEMPORAL REFERENCE SYSTEMS; THAI, LISU AND ENGLISH

BY

HEATHER WINSKEL

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Department of Psychology,
University of Durham.

ΓRACT

The aim of the research was to compare and attempt to explain the rate and pattern of acquisition of temporal terms in Thai, Lisu and English.

Of particular interest in this study, was the order of acquisition of temporal connectives in the three languages. It was expected that the order of acquisition would be affected by the underlying semantic complexity of the connective and by the relative ease or difficulty of the surface coding; of particular interest was the position of the connective in the clause or sentence. Other factors which contribute to the relative difficulty of acquisition of the connective for the child were also explored.

Also of major concern in this research were the tense-aspect systems of the different languages, which were examined and compared using semantic theory to represent the different surface structures of the languages.

The tasks used to compare the development of the temporal systems in Thai, Lisu and English children (3:6 to 7:6 years) were; an informal interview about the everyday activities of the child, two acting-out comprehension tasks (one involved playing with marbles, the other involved playing with small, plastic toy animals) and an elicited imitation task. Furthermore informal questioning and participant observations were used to collect information about the language environments and language socialisation of the children in this study.

The results indicated a complex interaction between general semantic/conceptual factors and language specific factors which included; syntactic - position of connective in the clause, effect of aspect on the interpretation of the temporal connective, and variation in the semantic range of 'translative-equivalent' forms of the languages in this study. Specific task effects and social and cultural factors also affected the results.

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ABSTRACT

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INDEX page no.

CHAPTER ONE - INTRODUCTION

AIMS OF THE RESEARCH

The aim of the research is to compare and attempt to explain the rate and pattern of acquisition of temporal terms in Thai, Lisu and English. One of the main concerns of this research is to look at the order of acquisition of the underlying semantic concepts of temporal connectives in the three structurally, very different languages. The underlying semantic complexity of the connective will affect the order of acquisition. It is expected also that the order of acquisition will be affected by the relative ease or difficulty of the surface coding; of particular interest here is the position of the connective in the clause or sentence. Other contributing factors which contribute to the relative difficulty of acquisition of the connective for the child are; the semantic scope of the connective used, i.e. the same surface structure can be used to represent different meanings, and also different surface structures can be used to represent a specific semantic notion. Additionally, other factors which will affect the results cross-linguistically are; task specific effects, familiarity with the types of tasks used, familiarity with the translations used in the tasks, relative usage of the terms in the everyday language community, social factors such as the status of the child and his/her language and behaviour in the language community. The language environment of the child in the community ultimately shapes and socialises the child to become a fully-fledged, fluent member of the society.

Also of major concern in this research are the tense-aspect systems of the different languages, which are examined and compared using semantic theory to represent the different surface structures of the languages. The interaction between aspect and temporal connective is also examined.

The tasks used to compare the development of the temporal systems in Thai, Lisu and English children (3:6 to 7:6 years) are; an informal interview about the everyday activities of the child, two acting-out comprehension tasks (one involves playing with marbles, the other involves playing with small, plastic toy animals) and an elicited imitation task. Furthermore an informal interview was given to the parents of the children in the study, in conjunction with observations, in order to compare the language environments of the children of the three different language communities.

1.1 GENERAL INTRODUCTION

A general theory of language development must be able to account for what the child acquires, ie the nature of the information the child must have to qualify as a fluent speaker and how the child acquires language. Various explanations have been postulated to account for this process. A great influence on theories and research on language acquisition has been Chomsky, who has argued that knowing a language entails internalizing a set of rules that underlies sentence construction. The task of the language learning child is thus a problem of rule formulation. From the limited sample of speech to which he is exposed the child must somehow arrive at a set of rules that will enable him to produce and comprehend an infinite number of possible sentences. Chomsky (1957, 1959, 1965), also attributed to the child an innate knowledge of linguistic universals, that is of whatever structural principles are common to all languages. This view by Chomsky only emphasised how knowledge of the linguistic code was acquired. Research was mainly limited to the exploration of how children learn morphology and syntactic rules, that is, rules governing the way in which morphemes combine to form words and sentences. The research emphasis was on "competence" - "the mental reality underlying actual behavior". Whereas "performance" or "the actual use of language" in concrete situations was not seen as a major emphasis of research, because it is affected by "such grammatically irrelevant conditions as memory limitations and

distractions, shift of attention and interest, and errors" (Chomsky 1965).

Chomsky also postulated the existence of a language acquisition device (LAD), which is characterised as a storehouse for information about language universals (e.g. that words fall into certain syntactic classes, that sentences are composed of a verb and its predicate, that language is characterised by certain kinds of formal properties and operations). This view that language development is to a large extent maturationally controlled and robust against a wide variety of environmental conditions seems to be supported by the fact that despite great cultural variation in child raising practices and in the specific treatment of language development, the overall course of language acquisition is very similar.

In contrast to the Chomsky-centered research, the acceptance of the Piagetian approach by many researchers stimulated a lot of work particularly in the domain of semantics. According to Piaget the structure of thought is neither innate nor a copy of the physical or linguistic environs, but rather it is the product of childrens' constructive activity in their various environs. Language on the other hand, is a symbolic system constituted of the structural relations between 'signifiers' and 'signifieds' (Piaget 1977). This view emphasising the representative function of language, had its effect on the studies of language acquisition, which saw cognitive development as the pace setter of language development unidirectionally

determining this process in all its aspects. However the nature of the relationship between cognition and language is not one of a one-way determination (e.g cognition determines language), but one of two way interaction. Slobin (1966) has suggested that what is innate is not a set of categories, structural relationship or rules, but is rather a set of procedures for analysing linguistic input. Slobin (1973) formulated his Operational Principles (OP) to explain cross-linguistic observations. OPs guide the child in developing strategies for the production and interpretation of speech and for the construction of linguistic rule systems. Furthermore some researchers disagreed with Chomsky's emphasis on 'competence' rather than 'performance' (Slobin 1967, Hymes 1964, 1971). They pointed out that the domain of linguistic knowledge with which Chomsky was concerned constitutes only one component of what the speaker must know in order to be fluent in his language and in fact by overlooking the actual uses of language in real situations, Chomsky was ignoring all the knowledge that speakers must draw on in order to produce utterances that are not only grammatically well formed, but also appropriate to the particular social contexts in which they occur. Besides knowledge of the linguistic code it is also important to investigate how the linguistic code is used in appropriate social settings to accomplish specific goals. The speaker must be able to produce utterances, that are structurally well formed, referentially accurate, and contextually appropriate, and to understand the speech of others as a

joint function of its structural characteristics and social context, i.e. communicative competence (Gumperz and Hymes 1964).

Chomsky's theory motivated a single focus on syntax and explanations based on structural complexity, whereas Piaget's theory motivated a focus on semantics and explanations based on cognitive complexity. Now the majority of research on language development considers all of the following three contributing factors, syntax, semantics and pragmatics and it is accepted that all three factors play an interactive role, and no single approach or emphasis is sufficient.

The prevailing cognitive view has been that the underlying concepts or semantic structure is primary, and much or all of language acquisition can be accounted for by reference to a child's general cognitive ability without invoking a language specific capacity. According to this cognitive view children are seen as possessing powerful cognitive capacities that enable them to organise and interpret their experiences independently of language. When language starts to come in, it does not introduce new meanings, but simply allows children to express those meanings they have already formulated. It has been argued that certain concepts are inherently less complex i.e. more salient or basic than others to adults and children, and that differences in complexity show up both in language structure and in the relative ease with which children acquire various linguistic forms. So according to this view, the relative meaning is the ultimate constraint since regardless of how

simple a syntactic device is, it will not be acquired unless the meaning it encodes is within the child's grasp. Conversely if the given meaning is relatively easy, but the way a particular language encodes this meaning is formally difficult for children, then children learning that language will not acquire the conventional means for expressing the idea until relatively late.

The typical method used by cross-linguistic researchers has been to study language acquisition, by investigating the length of time or order of acquisition of certain linguistic devices, This reflects the relative difficulty of the 'devices' for the child, and so provides clues to the childs' strategy for language acquisition. When the linguistic devices used to express a concept are the same across languages the emergence of this concept are the same across languages. Also if the linguistic devices used to express a concept vary, there will be variability in the emergence of this concept. For example Johnson and Slobin (1979), found that the order in which children learn English, Italian, Turkish and Serbo-Croatian acquired locative markers (in, on between etc. and their translation equivalents) could be predicted to a large extent on grounds of conceptual difficulty of the spatial notions involved and the relative salience in communicative settings. Discrepancies among orders of acquisition, where they existed could be explained in terms of special facilitating or retarding effects of the linguistic devices used by the different languages to encode the locative notions. Research has indicated that there is a

common cross-linguistic order in development of connectives. based on the meanings of these terms in English, Turkish, German and Italian (Bloom et al 1980, Clancy et al 1976). This gives support to the idea of there being a fairly autonomous development of semantic notions (Slobin 1973), specifically for locatives and connectives.However as Bowerman (1981) has stated the cognition first hypothesis can not account for cross-linguistic semantic variability. If language forms are mapped onto already formulated meanings, how are concepts that are needed for some languages but not others constructed? It is clearly implausible that children formulate on a nonlinguistic basis all the concepts that are required by all the world's languages and then map some of these into language but not others. More likely that experience with language must often instruct the child on the necessary concepts. Boundaries of languages are variable.

There is evidence that children show sensitivity even in their earliest sentences to the classification their language imposes on the constituent parts. Children show language specific patterns from the start (Bowerman 1985). The meanings children construct reflect a complex interaction between the child's own predisposition to categorise in certain ways and the category scheme suggested by adult usage (Bowerman 1981). Gopnik and Choi (1990) found that Korean, French and English children (1;4-1;8), used forms that have very different lexical and linguistic functions in the adult language. Whereas English children responded with an assortment of lexical types, Korean children consistently

used verbs to express concepts of disappearence and Success/failure at an extremely early age, and were using only a few nouns. The relatively lesser importance of nouns in Korean may lead the children to pay less attention to this area of language. In Korean verbs are more perceptually salient than they are in English; in Korean verbs occur at the end of the sentence. Furthermore nouns are often omitted in adult sentences. This research evidence suggests a two-way interaction between language and cognition.

Further recent evidence to support this interactionist view, comes from research on terms of motion in Korean and English. Choi and Bowerman (1991) have shown that children learning English and Korean show sensitivity to language-specific patterns in the way they talk about motion from an early age, as early as 17-20 months. For example, learners of English quickly generalise their earliest spatial words - Path particles like 'up', 'down'. and 'in' - to both spontaneous and caused changes of location and for 'up' and 'down', to posture changes, while learners of Korean keep words for spontaneous and caused motion strictly separate and use different words for vertical changes of location and posture changes. These findings challenge the view that children initially map spatial words directly to nonlinguistic spatial concepts, and suggest that they are influenced by the semantic organisation of their language virtually from the beginning. Choi and Bowerman posit an interaction between language input and cognitive development.

Language learners construct a highly structured and language specific meaning system (Bowerman 1985).

The overall similarity among children learning different languages suggests that children are motivated to develop certain words because these words are relevant to their specific cognitive concerns. At the same time the linguistic input may effect which problem the child chooses to focus on. Recent research seems to suggest that there is a two-way interaction between semantic and cognitive development, even at the earliest stage of language development.

The typical cross linguistic approach to the study of language development, generally assumes that cognitive development proceeds through the same stages and at more or less the same rate, and that communicative intentions arise from this conceptual basis regardless of the syntactic/semantic structure of the language being acquired. However as the recent research by Choi and Bowerman (1991) and Gopnik and Choi (1990) indicate this is a very simplified view of language development and ignores the possibility of interaction between cognitive development and the specific language being learnt. Furthermore the fact that the surface forms for a similar concept (eg. the locatives "in", "on" etc) in different languages are not translative-equivalents has been neglected (Bowerman 1981). Crosslinguistic research should take account of this variation in semantic structure. No attention is paid to the rough match to difference in the way these forms, together with other closely related forms,

divide up the domain of meaning over which they operate into contrasting categories (Bowerman 1981).

Bowerman (1981), summarises the child's task in learning a language. To learn a language involves not only discovering the linguistic code but also finding out the following:

1. the regularities or patterns in the language and the restrictions on how linguistic forms are patterned.
2. the regularities in the social and physical environment - ways of categorising and interpreting the significance of events in the world.
3. the contingencies between linguistic forms and physical and social meanings i.e. how the two sets of variables covary, e.g. the child must determine which linguistic variations are insignificant and which are linked in a regular way to variation in meaning. Conversely he/she must learn which discriminable differences in meanings are matched by difference in language forms and which are not, and what connections are i.e. which meanings are associated with which linguistic forms in his/her specific language, i.e. 'the mapping problem' (Clark 1975).

Research has now focused on what factors make the mapping problem difficult and what factors facilitate it, i.e. what is the effect of inconsistency or irregularity in the system with respect to mapping. Also how does the language environment of the child effect the mapping of the language. Inorder to try and disentangle factors involved in learning language it is necessary to compare the acquisition of languages that differ structurally in key aspects.

SUMMARY REMARKS

The initial emphasis of the 1960s on the acquisition of the structural aspects of language shifted to issues of semantics and finally to the important contributions of pragmatics in the late 1970s. Now it is well recognised that the problem of language acquisition can be approached only from a multidimensional perspective, considering the interplay of separate, semantic, pragmatic and cognitive factors that simultaneously bear upon the process (Aksu-Koc 1988). Such a multidimensional approach aims to delineate the interactive contributions of the different factors to the construction of the emergent system of the child at different stages in development. The domain of temporal reference in language is one where all these factors are relevant to the issue of acquisition. The general methodology used in this research on temporal systems follows the work of Slobin and colleagues. The view taken here is that much of language development can be accounted for by the child's general cognitive development. The underlying semantic concepts behind a language as well as the surface structure of the language affects the order or time of expression of a concept. Other contributing factors that have to be considered are pragmatic factors, semantic variation in the 'translative-eqivalents' used, and specific features of the tasks used in this study.

This research investigates the acquisition of the temporal system of three structurally very different languages, namely Thai, Lisu and English, and an attempt is

made to explain the order of acquisition of temporal terms, in terms of the relative ease or difficulty of the surface coding, semantic complexity, semantic variation of specific language terms, pragmatic factors and task specific features.

1.2 AN OUTLINE OF THE LANGUAGES USED IN THIS STUDY

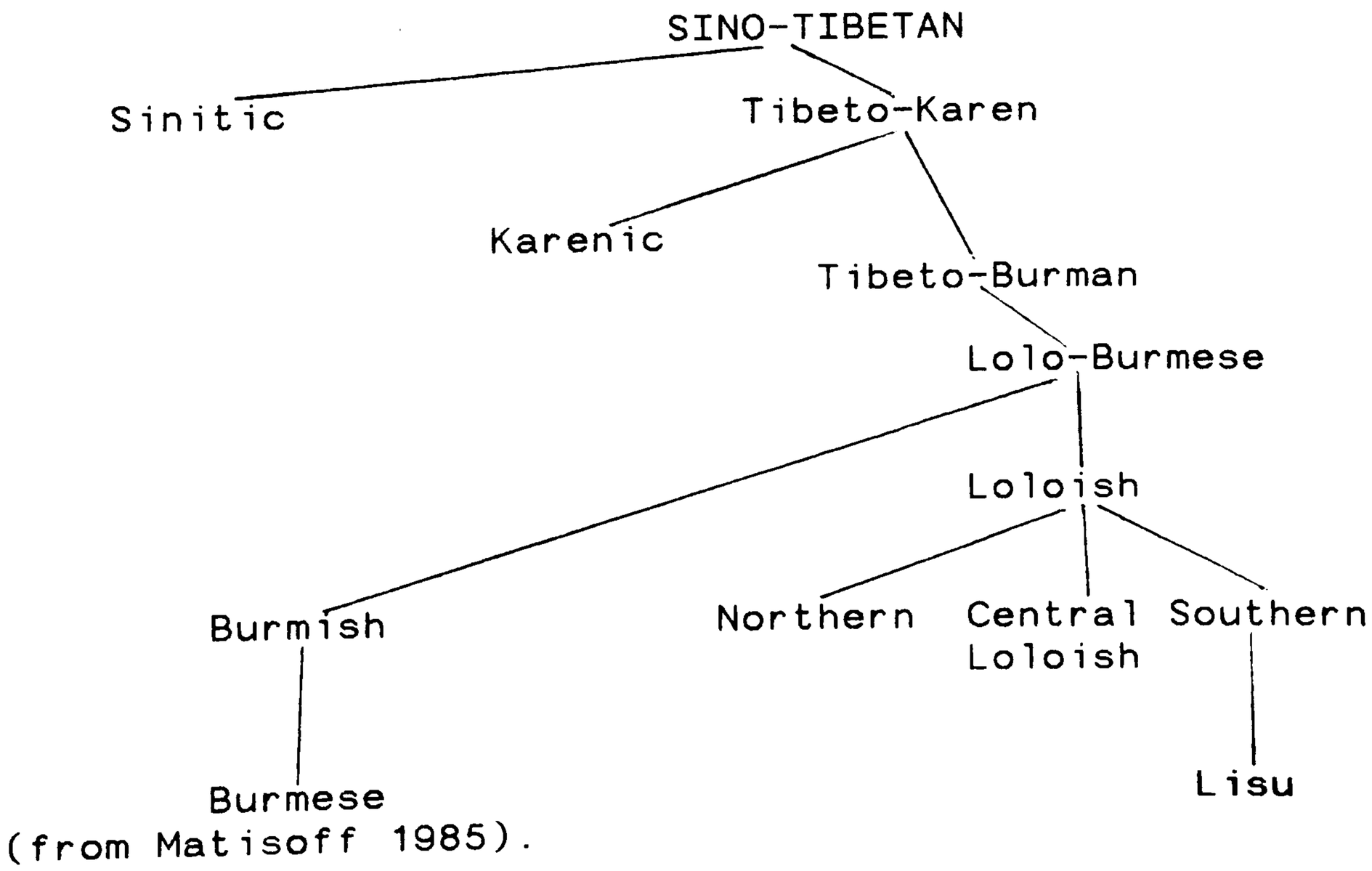
The three language groups used in this study were Lisu, Thai and English. The Lisu are a hilltribe people, who have relatively recently, in the past 60 or so years, migrated from Burma to the North of Thailand. It is believed that they originated from regions in the upper reaches of the Salween Valley (Young 1969). A survey carried out in September 1988 revealed that there were 128 Lisu villages in Thailand, comprising of 25,051 people (McKinnon and Vienne 1989). Thai is the major language of Thailand.

1.2.1 Language Classification and Characteristics

Lisu

Lisu is one of the central Loloish languages of the Burmese-Lolo language family, which belongs to the Tibeto-Burman language stock, of the Sino-Tibetan language superstock (see Diagram 1, from Matisoff 1985). Lisu in Thailand is highly sinicized in vocabulary (Hope 1974).

Diagram 1 The Language Family of Lisu



(from Matisoff 1985).

Lisu is a post-positional, verb final language. It is a tonal language, and has 6 tones. Lisu is a monosyllabic, isolating language, (the word forms do not change). Thai and Chinese also have these characteristics. There are no inflections, case markers or marking for person or gender. Number is marked only on personal pronouns and on a very few nouns. There is no active/passive distinction, no verb change for mood or choice. There is much compounding. Series of verbs express many of the relations which Indo-European languages either mark inflectionally or with specific devices to signal coordination and subordination.

Subject-hood is not an important organising principle for Lisu, in contrast to English. Instead Lisu has a Discourse Topic language orientation and zero anaphora once reference is established, which is similar to Chinese (Li and Thompson 1976). Furthermore, boundaries are fluid between the compound, phrase, clause sentence, complex sentence and the discourse chain.

The grammatical apparatus consists mainly of post positional particles, many of them deriving from nouns or verbs. The verb is the only obligatory category. The verb and its modifiers occupy the final position in the clause. Grammatical functions that might be realised as inflections in other languages are mostly carried out by word order or by grammatical particles. There are strict word order templates for expressing sentential relations. Sentences are organised around a predicate core and the arguments which a specific verb choice dictates.

Lisu overtly marks aspect but not tense. Time and duration can be specified periphrastically (by the use of separate words where necessary). Time reference is coded lexically by the use of adverbials like "tomorrow" and/or deductions about time reference from other aspects of the sentence or discourse, perhaps in conjunction with knowledge of the world. For example, sentences with the completed action aspect particle are frequently interpreted to have past time reference.

Also Lisu is not a written language. Lisu society is traditionally a non-literate society. See Table 5 for an overview of Lisu language in comparison to Thai and English.

Thai

Thai is a subgroup of the Thai-Kadai family which belongs to the Austro-Thai superstock, (see Diagram 2).

Diagram 2 The Language Family of Thai

AUSTRO-THAI (polysyllabic atonal)

Austronesian
=Malayo-Polynesian

monosyllabisation-tonogenesis
Tai-Kadai Miaou-Yao

Thai

Thai is a tonal language with 5 phonemic tones. Subject-Verb-Object contributes the most favored word order. Thai is a monosyllabic, isolating language, ie. the word forms do not change. Thai verbs have no inflection for time or number. Context, added time expressions or preverbs

generally specify the tense (see Table 1 for summary). Aspect can be modified grammatically.

There are areal similarities of languages in the S.E. Asia region, this is due to the contact these languages have had with each other. The languages of this region, which includes Lisu, Thai and Chinese do not have complicated inflectional morphology, instead they use affixation, compounding, elaboration and concatenation (strings of verbs juxtaposed around a head verb to form complex verb phrases). Aspect not tense is the primary inflectional category for verbs, (Matisoff 1985). Thai and Lisu have many common features with Chinese due to areal diffusion.

Table 1 Summary of the Characteristics of Lisu, Thai & English

Characteristics of language.	Lisu	Thai	English
Predominant word order.	SOV	SVO	SVO
	Monosyllabic tonal	Monosyllabic tonal	Polysyllabic atonal
Morphology	analytic or isolating	analytic or isolating	synthetic or inflecting
	Discourse language	Discourse language	Sentential language
	Pragmatic	Pragmatic	Grammatical
Major derivational processes	have affixation, compounding elaboration, concatenation, reduplication.		Display grammatical relationships morphologically
Tense	No tense system specified periphrastically.		Tense system
Aspect marked	Postverbal particles	Preverbal & postverbal auxiliaries	Progressive & Perfect
	Topic centered language.	Subject centered language	Subject centered language

1.3 TEMPORAL SYSTEMS OF LANGUAGES

It has been found from cross-linguistic research that when the linguistic medium used to express a time concept are the same across languages the emergence of the time concept are the same across languages (Weist 1986). When the linguistic mechanisms used to express a temporal concept vary, there will be variability in the emergence of the temporal concept. The morphology of tense and aspect varies greatly from one language to the next, and there is considerable variability in the emergence of these lingusitic structures. In contrast temporal adverbs, which are used to establish the reference time, are relatively stable across diverse languages. In Japanese, where the critical deictic relations and the aspectual relations of completion and continuation are invariably coded by readily accessible verbal suffixes, acquisition is precocious (Clancy 1985). However, in English, the important concepts of aspect are confounded with tense, obscured in the surface structure by discontinuous morphology involving auxiliary components and a verb system. Furthermore the auxiliary components have the same forms with other functions. As a result the emergence in English is relatively slow.

Inorder to compare the acquisition of the temporal systems of the three structurally very different languages in this study, a means of representing the underlying temporal notions of a language are necessary. I will now discuss this further.

1.3.1 TENSE-ASPECT

Tense is deictic, it locates the time of a situation relative to the situation of the utterance (Comrie 1976). Whereas aspects are different ways of viewing the internal temporal constituency of a situation (Comrie 1976).

Tense

Many languages lack tense, ie. do not have grammaticalised time reference, though they lexicalise time reference, i.e. have temporal adverbials that locate situations in time. Similarly aspect sometimes exists as a grammatical category, otherwise it is intrinsic to the verb, or expressed using other lexical categories, or as an interaction of the different components in a sentence. Tense can be used in a loose way to refer to forms in a natural language, and sometimes to what these forms represent. Different language systems perform the same practical function, but sometimes mark it grammatically other times not (Clifford 1975). The same essential information may be expressed in many ways. The fact that no bound form, or no form of a certain predetermined class, or even that no form at all expresses one of these notions does not mean that it is not expressed. Formulating 'tense' in this way avoids separating different languages, whereas if a formal criterion is used for tense (bound form markers, verb markers etc.) languages are separated into different classes. This notion of 'tense' is common to, and independent of the several ways in which it tomorrow) might be represented in various

languages; it is present in the semantics of natural language forms.

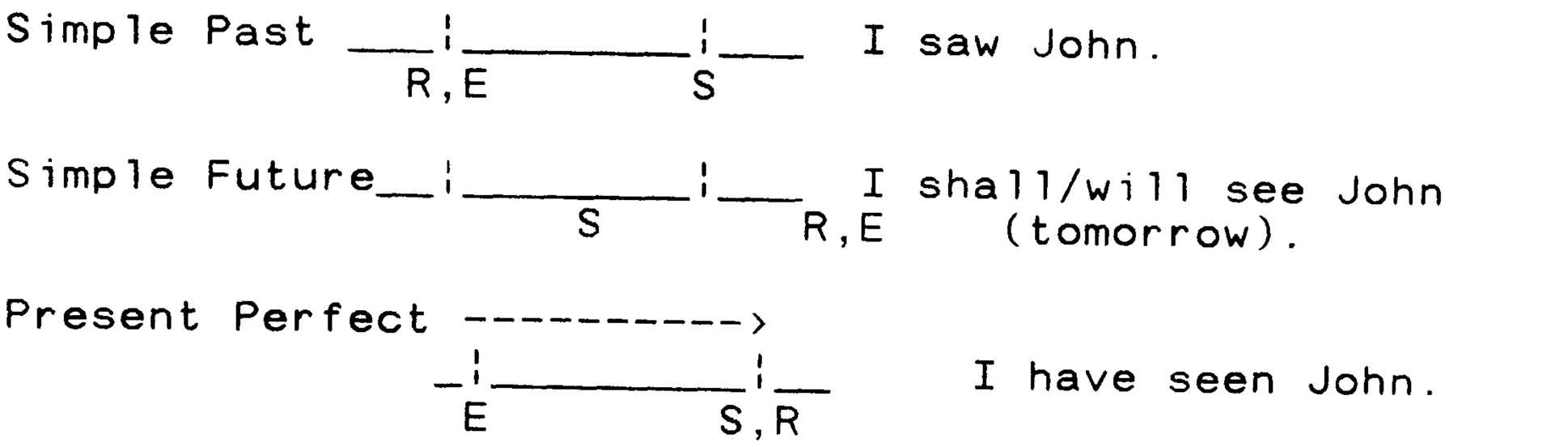
Propositional Logic or Tense Logic can be used to represent the deep structure of temporal features of a natural language. In natural language, even when a language has explicit tense markers, there will usually be other devices, which also express tense (e.g. verbs and temporal relation words). These various systems interact with one another creating redundancies. In tense logic the redundancies are removed, and all tense indication is done in a single system, in which all the tense features are explicit. Also tense logic is used for the expression of tense whereas the tense markers of natural language may have a number of uses (e.g. modal 'will' gives also the degree of certainty as well as future tense of anteriority), not involving tense.

'Tense' consists of three abstract relations anteriority, simultanteity and posteriority. The speech time (S) anchors the time that other times refer to (i.e. Reference time (R) and Event time (E)). Reichenbach's model can be used to characterise the different tenses in natural languages. The simple English present tense or its equivalent in other languages can be characterised as follows;

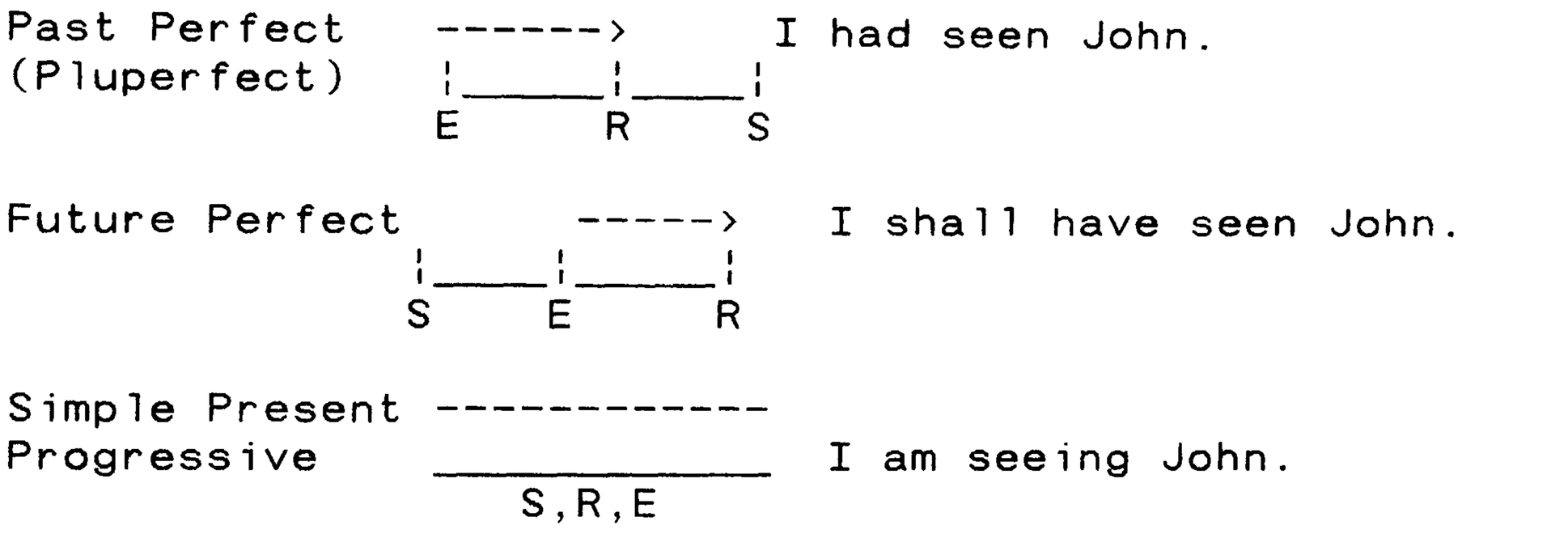
Simple Present _____|_____ I see John (English example)
S,R,E

Speech time (S), reference time (R), and event time (E) occur 'now', at the present time or simultaneously (from Soga 1985).

Other English tenses can be characterised as follows:



The arrow is to show the current relevancy of past event E at the time of R , the reference time (the perfect) and top dotted line is to indicate the continuousness of the action (progressive aspect).



Taken from Soga (1985).

The perfect indicates the present, continuing relevance of a past situation. It tells us nothing about the situation itself, but relates some state to a previous event. Also it

expresses a relation between two time points. The perfect is a secondary or relative tense (Bull 1971).

As stated previously tense can be specified using grammatical markers, or using Time Adverbial or additional lexical components. In English, tense is specified using grammatical morphology and time adverbials; of these only tense is obligatory in an English sentence. The future is specified using modals and/or time adverbials, i.e. "John will leave tomorrow", or by using the present tense with a time adverbial, i.e. "John leaves tomorrow", or by using the futurate progressive "John is leaving tomorrow". In other languages, which lack grammatical tense markers, in particular of concern here, Thai and Lisu, the language is mainly reliant on Time Adverbials and particles which signify "completed action" or a state of irrealis "incompleted action".

Temporal Adverbial Phrases

Different categories of temporal adverbial phrases that interact with tense in English have been characterised by Bennett and Partee (1972) as follows:

I Frame Adverbial phrase

This category refers to an interval or moment of time within which the described event is asserted to have taken place, e.g. 'this morning', 'three days ago', 'yesterday', 'at noon', 'now' etc.

II Adverbial phrases of number and frequency

Certain adverbial phrases indicate the number of times that a generic event is asserted to have occurred. Some

examples are 'never','once', 'twice', 'seldom', 'always', 'often', 'sometimes', 'usually', etc...

III Durative Adverbial Phrases

This category indicates the duration of the described event by specifying the length of time it is asserted to take e.g. 'for three hours', 'for three days', 'all day', 'until tomorrow', 'since yesterday' etc.

Carlotta Smith (1981) has classified temporal adverbials in terms of deictic, semi-deictic and non-deictic categories. Bennett and Partees' first category is deictic, ie. it locates the time of a situation relative to the time of the utterance. This first category is particularly important in languages that lack tense, as these deictic temporal adverbials are used to locate the Event time with respect to the Speech time, and so give "tense".

ASPECT

Aspect gives information about the internal structure of events in terms of temporal characteristic such as duration, punctuality, completion, iteration, inception. Aspectual markings impose a perspective on different portions of an event within its own temporal flow by parcelling it up to beginnings or ends presenting it as a point in time or in its ongoing phase (Comrie 1976).

There are two major categories of Aspect; the Imperfective or Durative action, which is regarded as having continuity or repetition in the past, present, or future, and the Perfective which indicates an action either completed in the past or to be completed in the future. Perfectivity

indicates the view of a situation as a single whole. without distinction of the various separated phases that make up that situation, while the imperfective pays essential attention to the internal structure of a situation (Comrie 1976).

English has two aspects; the Progressive or Continuous (Imperfective) e.g.

'I am reading the newspaper',

and the Perfect (Perfective), e.g.

'I have read the newspaper.'

In these two cases aspect is signalled directly by a particular surface or linguistic form - an aspectual morpheme, i.e. "be" + verb + "-ing" and auxilliary "have" + past participle.

<u>The Progressive</u>

The English Progressive has in comparison to progressive forms in many other languages an unusually wide range. In some languages the distinction between progressive and nonprogressive forms is obligatory, whereas in others the use of the specifically progressive form is optional, i.e. the non-progressive forms does not exclude progressive meaning. English belongs to the first type, so that the Progressive and non-Progressive are not in general interchangeable, nor can either of these be replaced by the other (Comrie 1976).

French has a specifically progressive form,

"Jean est en train de chanter"

but it is not frequently used, so that "John is singing" will normally be translated into French as "Jean chante".

In Thai there are specific progressive forms,e.g.

"Sombat **Kamlang** rong pleyng" Sombat is singing a song.

or "Sombat Kin Kao **yuu**". Sombat is eating.

However the non-progressive form does not exclude progressive meaning, i.e.

"Sombat rong pleyng" can be translated as either "Sombat is singing a song" or "Sombat sings a song".

In Lisu there is an obligatory progressive form, e.g. "Abe za dza **kya**" - "Abe is eating".

Abe rice eat **Progressive Aspect Marker**

In languages where progressive and non-progressive forms are not distinguished, or are not distinguished obligatorily, e.g. in French or Thai, then the nonprogressive forms will have a wider range than does the English non-progressive.

There is a difference between imperfectivity and progressiveness. Imperfectivity includes as a special case habituality, and a situation can be viewed as habitual without its being viewed as progressive, as with the English non-progressive Habitual in:

"John used to write poems"

which contrasts with the Progressive:

"John used to be writing poems"

A situation can be viewed both as habitual and as progressive.

Verbs tend to divide into two disjoint (non overlapping) classes, those that can appear in the progressive form, and those that cannot. This distinction corresponds to that between stative and non-stative verbs. The general definition of progressiveness is the combination of progressive meaning

and non-stative meaning. Stative verbs therefore do not have progressive forms. In English there are many verbs that are treated sometimes as statives and sometime as non-statives, depending on the particular meaning they have in the given sentence,

e.g. "Fred is silly" is a permanent state, whereas "Fred is being silly" i.e. Fred is acting in a silly manner at the moment, is not a permanent state.

Other languages have a more strict lexical classification. In English the general rule seems to be that lexically stative verb can be used non-statively and appear in the Progressive, while lexically non-stative verbs do not lose their ability to be in the Progressive by being used statively (Comrie 1976). The English Progressive has a meaning greater than the definition of progressivity as the combination of continuous meaning and non-stativity.

The Perfect

Aspect as we have been concerned with so far has been concerned with different ways of representing the internal temporal constitution of a situation. The Perfect is rather different from these aspects since it tells us nothing directly about the situation itself, but rather relates some state to a preceding situation. The general definition of the perfect is "the continuing relevance of a past situation". Not all languages that have forms with perfect meaning have the full range of the meanings listed below. Some languages have distinct forms for some of these meanings, whereas others do not,

eg. <u>Perfect of result</u> - a present state is referred to as being the result of some past situation eg. 'John has arrived' and he is still here.

eg. <u>Perfect of Persistent situation.</u>

A situation that started in the past and continues. (persists), until the present.

eg. 'We've lived here for 10 years'

<u>Perfect of recent past</u>

eg. 'Bill has just (this minute) arrived'.

<u>Perfect of experience (Experiential Perfect)</u>

eg. 'Bill has been to America'.

<u>The Experiential Perfect</u>

The experiential perfect indicates that a given situation has held at least once during some time in the past leading up to the present e.g. the distinction between, "Bill has been to America" - the experiential perfect i.e. Bill has had the experience of going to America and "Bill has gone to America" - the perfect of result. This implies that Bill is now in America or is on his way there, this being the present result of his past action of going to (setting out to) America. In the experiential perfect example there is no such implication. Here English makes an overt distinction between the experiential perfect and the perfect of result. In general however, English does not have a distinct form of the experiential perfect. In Thai and Lisu there are specific experiential perfect markers, e.g. we have a contrast between

"Kao Kin malakor". He eats papaya.

and "Kao Kin malakor **laew**". He has eaten the papaya already, which is equivalent to the present perfect,

and "Kao **keuy** Kin malakor" - the experiential perfect i.e. he has (had the experience previously of) eaten papaya.

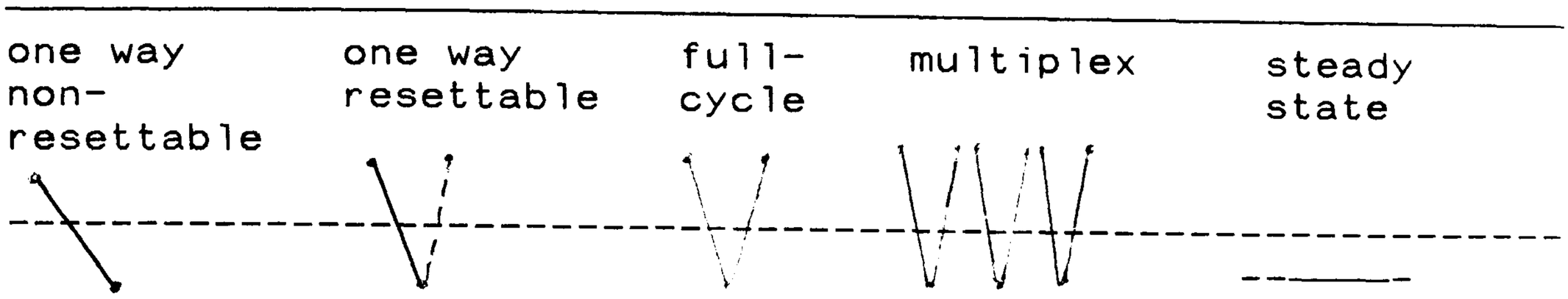
Similarly for Lisu, the experiential perfect is as follows,

"yi le be gyee **cua**" - He has (had the experience of) been to the pond, in contrast to "yi le be gyee **woe**" - He has been to the pond already, which is equivalent to the present perfect. The requirement of present relevance is still important.

Aspect Class and Form

The aspect of a verb can be realised in one of two ways grammatically; the aspect class (Situation aspect) i.e. the lexical classification of the verb, which is intrinsic to the verb and the aspect form (Viewpoint aspect) used i.e. grammatical aspect marking. The aspect class can be modified by the aspect form of the verb e.g. "-ing" or "have run" in English (Johnson 1981). A given verb normally denotes one kind of a situation i.e. a state versus an event or has an 'aspectual character', which interacts highly with aspect, (Lyons 1977). The aspectual meanings are lexicalised in the verb root, which is illustrated in Diagram 3 from Talmy (1985).

Diagram 3 shows how aspectual meanings are lexicalised in the verb root.



Aspect remains constant ie. "e" or changes over time "a-d". The verb roots' intrinsic aspect determines how it interacts with the grammatical elements that also have aspectual meaning e.g. "She took a breath once only". Situations are not described by verbs alone but rather by the verb together with its arguments (subject and objects included).

Vendler (1967) proposed a classification scheme (see Diagram 4) which partitions verbs initially into state versus dynamic with the dynamic set broken down into activity (or atelic i.e. has no end point) versus telic (i.e. has an end point) verbs. Finally telic verbs are divided into achievement and accomplishment verb. (However Comrie states that a telic situation should have a process leading up to a terminal point as well as a terminal point, i.e. "John reached the summit" - an achievement is not therefore telic, only accomplishments are.) Stative verbs refer to situations which remain stable unless something happens to change them, e.g. 'to love ' and 'to know'. In contrast dynamic verbs refer to situations which must be maintained by continued input. Activity (or atelic) verbs involve pure action e.g.'to

cry'. 'to run', 'to walk'. In contrast, telic verbs are related to situations which have a well defined terminal point e.g.'to go','to come' or 'to dress'. The process leading to the terminal point of an accomplishment verb can be intermittent, as in 'to build', 'to run 10 miles', 'to drink a bottle of water'. Achievements are the terminal point of an event, they do not have a process leading up to the terminal point. The classification depends on a set of linguistic tests (Dowty 1979), e.g. If z is an activity verb, then X is (now) zing entails that X has zed (Dowty 1979).

Diagram 4 Vendler (1967) classified the semantics of aspectual Classes of verbs in English as States, Activities, Accomplishments and Achievements, eg.

*(period) STATES	*(homogenous) ACTIVITIES	*(heterogenous) ACCOMPLISHMENTS	*(punctual) ACHIEVEMENTS
know	run	paint a picture	recognise
believe	walk	make a chair	spot
have	swim	deliver a sermon	find
desire	push a cart	draw a circle	lose
love	drive a car	recover from an illness	reach
			die

* indicates Moens and Steedman's classification terminology

Activities and accomplishments are defined as processes that extend in time and have successive phases; both can occur with a progressive auxiliary, eg.

'John is walking' 'Mary is painting a picture'.

Accomplishments and Achievements can take time adverbials with "in", eg. "in an hour". Activity verbs can take "for",

but not "in". There are exceptions to these rules eg."John is dying", "I am living" (Dowty 1979).

Verkuyl (1972) and Dowty (1979) have pointed out that this kind of classification is a classification of sentence meanings rather than of verbs only. The different components of a sentence all play a role in determining what class an expression belongs to. As Moens and Steedman (1986) have pointed out, this Vendler type classification is not a fixed classification, but is a dynamic one, i.e. when a verb is combined with different contexts or different linguistic material, then the category can change. Moens and Steedman (1986) developed the Vendler taxonomy a stage further for English to include this dynamic feature and also further categories based on the consequence of an event for a point or interval of time. The different categories used by Moens and Steedman (1986) are summarised in Diagram 5.

Diagram 5 Moens and Steedmans' aspectual classification system for verb expressions (round brackets enclose terms used by Vendler).

	EVENTS		STATES
	atomic	extended	
+conseq (goal-oriented)	**CULMINATION** (Achievements) recognise, spot win the race	**CULMINATED PROCESS** [telic] (Accomplishments) build a house, eat a sandwich	**STATES** (States) resemble love understand know
-conseq. (non-goal oriented)	**POINT** hiccough, tap, wink	**PROCESS** (Activities) [atelic] run, walk, swim, play the piano	

According to Moens and Steedman the categories in Diagram 5, for a given verb are changeable depending on the context and condition satisfying the requisites, eg. a process can become a culminated process if given a consequence, ie run ----> run a mile, and vice versa a culminated process can become an activity if the consequence is removed.

The **progressive auxiliary** allows a process to become a progressive state,

eg. "John is working in the garden".

A **culminated process** can only combine with a progressive if for example the culmination point is "stripped off", and so becomes a process.

eg. 1. "John writes a novel" becomes 2. "John writes" which with the progressive auxiliary becomes

3. "John is writing", which focusses on the process part of the verb.

Whereas a **Culmination** for example has to be made into a culminated process by combining with the progressive auxiliary and then the culmination point is stripped off and so it becomes a preparatory process,

eg.1. "John reaches the top". 2. "John is reaching the top".

Points need to be iterated to take the progressive auxiliary,

eg. John was tapping on the door.

States have to be turned into a process first before they can combine with the progressive auxiliary.

eg. "Harry is rude".

"Harry is being rude", which tells us about Harry's current behaviour.

Diagram 6 Processes can take the progressive auxiliary, but for the other types of verb arguments to take the progressive auxiliary they have to be turned into processes.

	CULM.	CULM.PROCESS	STATE	PROCESS
Progressive auxiliary	X	X	X	√

change to a process

A **perfect auxiliary** maps a culmination into its consequent state. The present perfect describes the consequent states of the core event as (currently) holding.

eg. "Max has built a house". "John has reached the top".

Process expressions like "work in the garden" have to be turned into a culminated process, in this example the temporal adverbial "until today" is used, before it can appear in the perfect, as it has to be currently in force, i.e.

"I have worked in the garden" becomes

"I have worked in the garden **until today**"'.

Stative verbs do not normally take a perfect auxiliary. A state has to be turned into a culminated process,

eg. 'Know the answer'

'John knows the answer' a State with

'The answer for years' becomes a Culminated process

and can take the perfect auxiliary, i.e.

'John has known the answer for years'.

Diagram 7 A culmination can take the perfect auxiliary, but a state or process has to be given an end point before they can take the perfect auxiliary.

	Culmination	Culm.process	State	Process
Perfect auxiliary	√	√	x	x

The perfect is defined in terms of the consequent state of a core event which is in progress.

The Vendler - Moens-Steedman taxonomy will be used for classifying the aspect of childrens' utterances in the three languages of this study.

Tense and Aspect Combinations

One of the most interesting relationships between aspect and tense, from the viewpoint of language as a functional system occurs when an aspectual distinction is restricted to one or more "tenses", (or more generally when talking about anteriority, simultaneity or posteriority), rather than operating across the board independent of tense. It appears that the tense that most often evinces aspectual distinctions is the past tense (anteriority). In English, the linguistic distinction between different aspectual features of events are much less common in reference to future events than they are in reference to past events (Comrie 1976). The linguistic expression of aspect in English is more complex in the future domain (Harner 1981). The combination of progressive aspect with "tense" in the different languages of this study will be examined in the Conversation Task material.

1.3.2 TEMPORAL CONNECTIVES

Sequentiality and Simultaneity

Sequentiality

The semantics of **sequentiality** in a sentence using for example the temporal connectives; '**before**', '**after**', '**and then**', '**and next**', can be characterised in terms of formal semantic logic as follows;

"If p is before q it is always true that p is wholly before q and that at the same time q is beginning and p is already over" (Bennett and Partee 1972).

These connectives e.g. '**before**', '**after**', '**and then**', are used to indicate the order of events. For example,

"John left before Mary arrived yesterday"

"John left" precedes "Mary arriving". In other words we have incident p followed by incident q. "Before" indicates a prior event, whereas "after" indicates a succeeding event. In English "before" and "after" can be used as adverbials, e.g.

"Before breakfast I had a bath"

or as a conjunction, e.g.

I had my breakfast before I had a bath".

And can have two meanings in English, it either indicates sequentiality i.e.

"John got drunk and then he fell down last night."

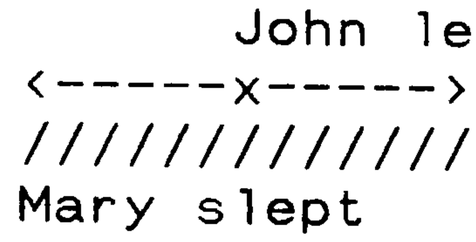
or simultaneity i.e.

"John knitted the jumper and watched TV".

Meaning that "John knitted the jumper and watched TV at the same time", or that "While John knitted the jumper he watched TV too".

Simultaneity

While , when, together, at the same time, can all mean "during the time that" (Bennett and Partee 1972). For example: "John left while Mary slept" which can be characterised as in the following diagram:



This indicates that John left some time/point during the interval of time that Mary slept. Events can occur at a simultaneous point in time, or states, which have duration can overlap, or a combination of the two can occur, so that an event occurs at some point within the duration of the stative verb (as in the example above}.

When can either express a state or event sequence, e.g. "When the kettle boils I make the tea" or it can express simultaneity, e.g. "When I watch television I do my ironing". A "when" sentence can have an ambiguous interpretation of either sequential or simultaneous meaning. However the interpretation is unequivocal if the progressive is used, which makes the meaning equivalent to "while" or "at the same time".

If the connective **while** is used, the durative aspect of the verb(s) is focussed on and either form of the verb, progressive or non-progressive can be used.

together/at the same time distinction "**together**" can be used to indicate simultaneity of an event or action by two subjects, e.g.

"The girl and the boy fetched the water together".

"together" in English cannot be used to indicate the simultaneous occurrence of two events or actions by two actors

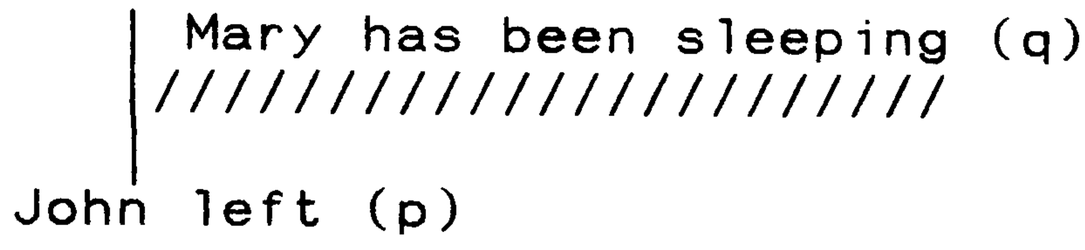
or subjects. For example,

"The boy fetched the water and the girl swept the floor together"

instead "**at the same time**" has to be used.

<u>Since and Until</u>. "since" in terms of tense logic can be characterised as follows:

In a sentence p,q "p was the case and at every moment between that moment and now, q has been the case". (Clifford 1975).



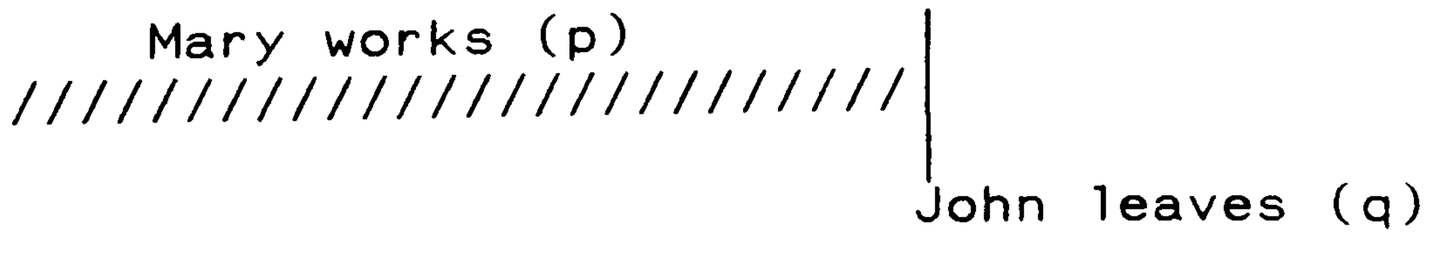
"Since John left yesterday Mary has been sleeping".

If a progressive action is used in the first clause, then the connective "since" causes the focus to be on the inception of the action, eg. "Since she has been sleeping, he has been working hard", ie. the focus is on when she went to sleep. The order of mention of events in English, can be reversed by changing the position of the connective. The independent clause can be in the present perfect but not in the simple past. "Since" also has the additional meaning of "because of" in English. "Since" has a similar function as "after", but includes a duration aspect.

If a progressive action is used "**until**" means "up to the time that"

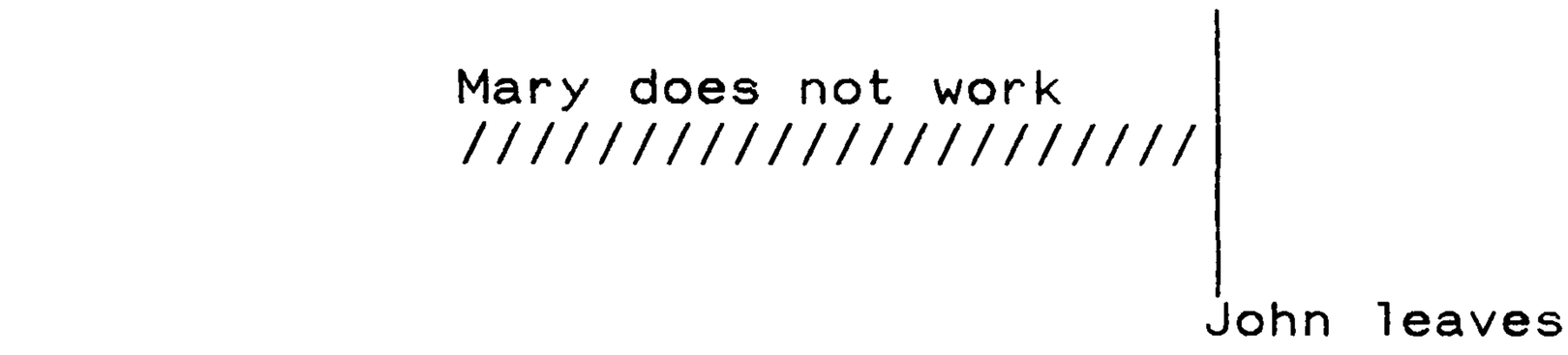
e.g. "Mary will work until John leaves tomorrow"

which can be characterised as follows:



As can be seen, "until" is the mirror image of 'since'. In terms of tense logic: In a sentence p,q " p was the case at every

moment between that moment and up to q was the case" However 'until' unlike 'since' can be used either in the simple future or in the simple past or in the present in English. "Until has a similar function as "before", but includes a duration aspect. "until" is often used with a negative, which slightly changes its character, eg. "Mary does not work until John leaves", which can be characterised as follows;



As stated previously, the semantic model will be used for comparing the languages, which are structurally very different, in order to investigate the emergence of the different components of the temporal systems.

1.3.3 THE TEMPORAL SYSTEM OF ENGLISH

Tense

The main linguistic forms with temporal values are tense and time adverbials; of these, only tense is obligatory in an English sentence. Time adverbials occur optionally. The basic unit for temporal reference in English is a composite consisting of a tense and a time adverbial. The combination of tense and time adverbial specifies the Reference Time (RT). The preposition that introduces the time adverbial gives the relation between RT and ET (Event Time),

eg. Roger called before noon.

In this sentence the combination of past tense and 'noon' specifies a past RT; "before" indicates that ET precedes RT. There is no explicit reference to ST, but the value of RT includes the relation of RT to ST (Smith 1981). Below is an analysis of the temporal grammar of English based on Carlotta Smith's paper. Relational values ie. anteriority, simultaneity and posteriority, that correspond to the semantic interpretation of temporal forms in English are used.

English Temporal Reference

	ANTERIORITY	SIMULTANEITY	POSTERIORITY
Tense	past	present	future-'will' and other modals
Adverbs	yesterday etc	right now etc.	tomorrow etc
Prepositions	before etc.	at, on, etc.	after etc.
RT	Past	Present	Future

The combination of tense and time adverbial are given on the next page for English (Carlotta Smith 1981).

TENSE	ADVERB	RT
Present	Present	Present eg. Mary is swimming now.
Present	Future	Future eg. Mary is swimming tomorrow.
Present	Past	Past eg. Last week Mary is swimming in the pool when.....
Past	Present	Not possible
Past	Future	Not possible
Past	Past	Past eg. Mary played soccer yesterday
Modal "will"		Function of I "will".
Future	Present	Present eg.I will go now (modal).
Modal "will"		
Future	Future	Future eg. I will go tomorrow.
Future	Past	
Modal "will"		

In English the modal verbs have a dual function; the modal function which refers to the degree of certainty and the temporal function which refers to future action.

There are many sentences that do not have a time adverbial. They are interpreted with information from context, linguistic and other, or by general heuristic strategies. Generally time adverbials together with tense establish the relational value of RT, ie. posteriority, simultaneity, or anteriority, and they specify RT; they give the relation between ET and RT. There are three classes of adverbs; adverbs which are always anchored to ST, eg. "yesterday" and "tomorrow" (deictic), adverbs such as "on Tuesday" and "at noon" may, but need not be anchored to ST, and adverbs such as "previously" and "afterward" (dependent) never anchor to ST, (Smith 1981).

Aspect

English has two grammatically marked aspects (Viewpoint Aspect); the progressive and the perfect. The progressive is formed from the auxiliary "be" and verb suffix "-ing". The perfect is formed from the verb "have" and the past participle. This is shown in the example on the next page.

eg. He is having breakfast. The progressive

He has eaten breakfast. The perfect

The English Progressive

The English Progressive is signalled by the verbal auxiliary "be" and the verb suffix "-ing" eg.

"She **is** **running** in the garden."

In English, the realisation of imperfective aspect is more complex syntactically than is the perfective (Smith 1981). Perfective or simple aspect is indicated by a verb + tense form, imperfective by the auxiliary "be" + "-ing". For a more detailed discussion of the English Progressive, in comparison to other Progressives see the previous section, page 25.

The English Perfect

The present perfect is only one of the possible tenses of the perfect, it expresses a relation between present state and past (prior) situation. The past perfect (Pluperfect) eg. "John had eaten a cake" expresses a relation between a past state and an even earlier situation. The future perfect eg."Mary will have eaten the cake", expresses a relation between a future state and a situation prior to it. There is no specification of the absolute time of the prior action. The English Perfect may not be used together with specification of the time of the past situation ie. one cannot say "I have got up at 5 o'clock this morning." The English perfect is incompatible with a point in time. However one can say , "I have seen X this morning", providing it is still morning.

The experiential perfect indicates that a given situation has held at least once during some time in the past leading up

to the present eg. "I have (on some occasion) got up at 5 o'clock this morning." This does not refer to one specific 5 am, but over many previous instances of 5 am. English does not have a distinct form of the experiential perfect.

The Perfect of Result is when a present state is referred to as being the result of some past situation, eg. "John has arrived" and he is still here. In English there is a tendency to use the stative present for this meaning,

eg. "he is tired".

literally "he has got tired"

eg "he is standing"

literally "he has stood up".

<u>English Connectives used in this study</u>

The English connectives used in these tasks are; **then, after, before, when, while, until, since, together** and **at the same time.**

Below I discuss some of these connectives, see the previous section for more detail about temporal connectives.

THEN signifies sequentiality. It can be expressed using "and", which can indicate sequentiality or simultaneity, "and then" combination is used to indicate sequence too.

AFTER can be placed at the beginning of the first clause or between the two clauses, signifying the actual order of events, or reversing the order of events. In the tasks used here, it takes initial position only.

BEFORE is similar to "after" in that it can be placed either at the beginning or between the two clauses. In the tasks used in this research, it takes the mid-clause position, so that the

actual order of events is maintained.

WHEN (see previous section) In the tasks it is placed in initial position.

TOGETHER /AT THE SAME TIME "Together" can be used to signify that two actors do an action simultaneously. It cannot be used to signify two actors doing two actions simultaneously eg. "John and Mary go to the cinema together" but not "John goes to the cinema and Mary goes to the park together" we must use "at the same time" for this type of sentence. In the Toy and Marble tasks "together" was used. In the E.I. task the connective "at the same time" was used.

1.2.4 TEMPORAL SYSTEM OF THAI

Thai has aspect markers, but not tense markers. For "tense" there is a marked emphasis on adverbial cues. Adverbs are normally relied on to give the Relational value, ie. deictic adverbs such as 'yesterday', 'tomorrow',or clock-calendar adverbs eg. 'on Tuesday', 'at noon' and dependent adverbs eg. 'previously', 'afterwards', 'later' are used.

THAI TEMPORAL REFERENCE

	ANTERORITY (PAST)<---	SIMULTANEITY (PRESENT) =	POSTERIORITY (FUTURE)--->
Temporal Auxiliaries	completed action V + aux 'laew' = present perfect		aux 'ja' + V and other modals
	aux 'dai' + V (past) negative only		
	aux 'keuy' + V (experiential perfect)		
Adverbs	'yesterday'- 'meua wan'	'right now'- 'ton nee'	'tomorrow'- 'phroong nee'
Prepositions	'Before' 'gorn'	'at' 'tii'	'after' 'lang jaak'
RT	Past	Present	Future

Aspect

Progressive aspect can be marked by either using the preverbal auxiliary '**kamlang**' or the verb '**yuu**' (is) placed at the end of the sentence,

eg. 'Kao **kamlang** kin kao' or

'Kao kin kao **yuu**'

'He is eating'.

Completed action/change of state can be signalled by using the postverbal device '**laew**' (already/now), "laew" can be used with a verb eg."set laew" "finished" or "maa laew", "has happened already".

eg. 'Chan Kien jotmai **laew**'

Literal translation I write letter already.
English equivalent: 'I have written a letter already'.

eg. 'Kao pai **laew**'
Literal translation He go already.
English equivalent: 'He has gone already'.

Here the use of "laew" is equivalent to the English Present Perfect.

eg. 'Chan pai Krungthep (song pee) maa laew'.
Literal translation I go Bangkok two years come already.
English equivalent: 'I have been to Bangkok (two years ago) and come back already'.

Preverbal auxiliaries form part of the temporal system. Modal verbs eg. '**ja**', 'will','at ja', 'maybe', 'kuan ja', 'probably', indicate a state of irrealis as well as uncertainty.

The **experiential perfect** is expressed using the preverbal auxiliary '**keuy**' eg. 'Chan **Keuy** pai Chiangmai'
- 'I have (on occasion/had the experience of) been to Chiangmai'
- the experiential perfect.
in contrast to 'Chan pai Chiangmai **laew**'
- 'I have gone to Chiangmai already' - equivalent to the Present Perfect in English,

The past "tense" or anteriority is usually expressed by using the verb and an adverb of time, however another way of showing past "tense" is to use the words "meua", "when" and "gorn", "before" separated by an adverb of time, and in this construction these two words can generally be translated as "ago" (Campbell & Shaweewongs 1968). "Thii laew" "ago" or simply an adverb of time can be used or other devices such as "thii

phan maa laew" can also be used for this function eg.

'meua song pee gorn chan pai Chiangmai'

When two years before I go Chiangmai

Two years ago I went to Chiangmai

or 'Song pee thii laew chan pai Chiangmai'

Two years ago I go Chiangmai.

"Mai dai pai" literally meaning "no can go" is used to indicate a negative past action, ie. "I did not go". This expression is often used in response to a question, eg.

'Wan nee khun pai Chiangmai mai?' 'Chan mai dai pai leuy'.

Today you went to Chiangmai? I did not go at all.

LAEW signifies completed action or change of state.

Resultant State function

With stative predicates the force of this particle 'laew' is often to indicate a state resulting from some previous situation, as in

"Kong paeng **laew**"

Thing expensive **change of state**

Things are expensive (now),

but with the implication that once things were not expensive, ie. they have become expensive ie. pictorially;

	change of state
not expensive	now expensive

This contrasts with 'Kong phaeng maak'

Things are very expensive

where there is no implication that things were ever otherwise.

Another example is;

"Chan rak kao **laew**"

I love him **change of state**

I love him (now)

meaning that previously she did not love him but now does ie. pictorially;

change of state	
previously did not love him	now loves him

Current relevance of anterior function

With activity, accomplishment, achievement verb predicates, which already involve a change of state ie. are dynamic rather than stative, laew has a "completed action" function - perfective (PFV) aspect.

eg. 'chan kin kao **laew**'

I eat rice PFV

I have eaten already which is often used to indicate that the person is not hungry as he/she has eaten already.

eg. 'kao pai seu kong **laew**'

he go buy thing PFV

he has gone shopping already

'Laew' indicates perfective aspect and relative past time reference (current relevant state)

Mandarin Chinese also has a clause final particle with the general meaning of 'current relevance' or 'CR' of new situation (Li et al 1986). It does not emphasise anteriority of the event but only current relevance.

The experiential perfect is not expressed in Thai using 'laew'. There is instead an 'experiential' form 'keuy' eg.,

'Chan **keuy** kin malakor', I have eaten papaya (had the experience

of).

Thai Connectives used in this study

THEN 'laew gor' occurs between clauses or 'lae' meaning 'and' can be used to signify sequentiality or simultaneity.

AFTER 'lang jaak' must be positioned at the beginning of the first clause in order of mention, unlike English it cannot be placed in the middle of the two clauses reversing the order of mention. All sentences used in the tasks are used in the order of mention.

BEFORE 'gorn' is placed after the first clause and so reflects the order of mention. It appears at the beginning of the first clause and cannot be used to reverse the order of mention.

All sentences in these tasks are used in the order of mention.

'Gorn' is a much used word, often combined to produce different meanings eg. 'meua gorn' meaning 'previously', 'song pee gorn' meaning two years ago'.

WHEN 'Meua' can be placed at the beginning of the clause or between clauses 'meua' is often combined with other words to produce various temporal terms eg. 'meua wan' 'yesterday', 'meua gii' 'a moment ago'.

WHILE 'Kana thii' equivalent to 'while' normally appears at the beginning of the first clause.

TOGETHER 'duay gan' means 'together'. It normally appears at the end of the first or second clause.

'duay' means 'also', 'gan' is added to the end of words to mean 'together'. Another word 'promgan' means 'at the same point in time' is also often used. In all tasks "duaygan" was used.

UNTIL 'theung' appears between clauses and is equivalent to

'until' in English. It is used for different functions too, and there are other ways of expressing the meaning of 'until' in Thai.

SINCE 'tang tae' is positioned at the beginning of the first clause. 'tang' means 'is situated'.

The connectives in the English test sentences were placed in the same order as the Thai test sentences, so that there was no reverse order of mention of events in 'before' or 'after' sentences.

1.3.5 TEMPORAL SYSTEM OF LISU

Lisu lacks absolute tense but encodes aspect. Lisu has clause final particles that encode information about completed, ongoing and experiential events or actions. The temporal system of Lisu consists of clause final particles, aspect markers, time adverbials and lexical devices. Lisu relies on temporal adverbials to give "tense". (See the Table below).

LISU TEMPORAL REFERENCE

TEMPORAL POSTERIORITY EXPRESSIONS	ANTERIORITY (PAST) (<----)	SIMULTANEITY (PRESENT) (------)	(FUTURE) (----->)
Particles	**woe** completed action (already)≡ present perfect **cua** - experiential perfect		modals
Adverbs	'yesterday'- 'ame'	'now/today'- 'amesa/nime'	'tomorrow'- 'sane'
Conjunctions	'before'		'after'
RT	PAST	PRESENT	FUTURE

Temporal adverbials and context are mainly used to indicate temporal relational values.

Aspect

'**Kya**' is a verb final particle that indicates progressive aspect

eg. "noo za dza **Kya**". you rice eat **progressive**

You are eating.

'**Woe**' is a verb final particle that indicates completed action (PFV=perfective).

eg. "yi za dza **woe**". he rice eat PFV

He has eaten (already).

eg. "yi seuseu dza **woe**". he fruit eat PFV

He has eaten the fruit (already).

'Liu' is a verb final particle that indicates a change of state.

eg. "za bu **liu**". eat enough/full **change of state**

(I) have eaten enough (now)

eg. "ngwa seu **liu**". I know **change of state**

I know (now).

eg. "Ami bia su **liu**". Ami snack wants **change of state**

Ami wants a snack (now).

<u>Temporal Connectives used in this study</u>

THEN '**atiga**' or 'bia' or 'atibia' can be used to signify sequentiality, which takes inter-clause position in a sentence. Often no connective as such is used to convey this meaning or relationship between two clauses.

AFTER '**ganya**' occurs between the two clauses of a sentence, it cannot be used to reverse the order of events.

BEFORE '**gache**' is positioned preverbally in the middle of the first clause in the Marble and Toy tasks, but between clauses in the Elicited imitation task.

WHEN '**thae**' appears at the end of the first clause, it is often combined to form other temporal words eg. 'athae' 'when'?

WHILE In Lisu there is not a single word for 'while'. In the Marble and Toy Tasks, 'when' '**thae**' was used with the continuous marker '**kya**' to represent the meaning 'while'.

TOGETHER '**itilae**' means 'at the same time'. It is positioned either at the end of the second clause (Elicited Imitation Task) or preverbally in the second clause (Marble and Toy Tasks). 'itilae' was used for both separate translations in English; 'together' and 'at the same time'.

UNTIL 'bia' in the Marble Task, it appears at the end of the second clause. In the Toy and Elicited Imitation Tasks, it appears between the two clauses. It can also be used for 'then', its function seems to be to indicate sequence.

SINCE 'gapuma' appears between the two clauses.

See Appendix 1 for a summary of the position of the temporal connectives in the task sentences in English, Thai and Lisu.

THE ASPECT SYSTEMS OF ENGLISH, THAI AND LISU COMPARED

TABLE 2 THE ASPECT FORMS OF LISU, THAI AND ENGLISH

IMPERFECTIVE	LISU	THAI	ENGLISH
PROGRESSIVE	postverbal particle **'Kya'**	auxiliary **Kamlang**+V or V+**yuu**(is)	'be'+ Verb gerund -ing
IRREALIS	modals and hypotheticals	aux **ja**+V +other modals	will +infinitive +other modals
HABITUAL			'used to' +infinitive (past only)
PERFECTIVE			
PRESENT PERFECT	post verbal particle '**woe**' -completed action	V+auxiliary **láew** -completed action	'have'+past participle
EXPERIENTIAL PERFECT	post verbal particle '**cua**'	auxiliary **Keuy** + V	no specific form
PLUPERFECT			past of 'have'+ past participle

Table 2 summarises the different aspectual forms of Lisu, Thai and English. These have already been discussed in the separate language sections. Table 3 summarises the two different categories of aspect in a verbal expression; Situation aspect (class) and Viewpoint aspect (form). The Table also reviews the Viewpoint aspect markers for English, Thai and Lisu.

TABLE 3 ASPECT SYSTEMS - SITUATION AND VIEWPOINT ASPECT

SITUATION ASPECT (Class) inherent in the verb phrase.

IMPERFECTIVE		PERFECTIVE	
continuous or repeated		completed or to be completed	
States	**Activities or Processes**	**Accomplishments or Culminated Processes**	**Achievements or Culminations**
eg. Know	(atelic) eg. run	eg. run a mile	(telic) eg. reach the top

VIEWPOINT ASPECT (form)- grammatically marked.

	IMPERFECTIVE	PERFECTIVE
ENGLISH	Progressive **'be' + 'ing'** eg. is running was running will be running has been running	Non-Progressive **no marking** eg. runs ran will run has run **Past tense** indicates completed action (as well as tense) eg. ran (has run already)
THAI	Progressive **'Kamlang' or 'yuu'**	Change of State/Completed Action **'láew'** eg. Kin Kao láew I have eaten already
LISU	Progressive **'kya'**	Completed Action **'woe'** Change of State **'liu'**

TABLE 4 PERMITTED COMBINATION OF VIEWPOINT ASPECT (FORM) WITH SITUATION ASPECT (CLASS) IN LISU, THAI AND ENGLISH

	SITUATION ASPECT			
	PERFECTIVE		IMPERFECTIVE	
VIEWPOINT ASPECT	CULMINATION	CULMINATED PROCESS	PROCESS	STATE
IMPERFECTIVE				
The Progressive				
ENGLISH	X	√	X	X
THAI	X	√	X	X
LISU	X	√	X	X
PERFECTIVE				
The Perfect/Completed action.				
ENGLISH (Perfect)	√	√	X	X
THAI (Completed action/ change of state 'laew')	√	√	√	√
LISU (Completed action 'woe')	X	√	√	X
(Change of state 'liu')	X	√	X	√

Table 4 demonstrates how Situation aspect combines with Viewpoint aspect in English, Thai and Lisu. From Table 4 we can see that the Progressive in English, Thai and Lisu can combine with a Culminated Process, but Culminations, Processes, or States have to be turned into Culminated Processes to take the Progressive. The English Perfect can combine with a Culminated Process or a Culmination. The Thai completed aspect marker can combine with a Culmination, a Culminated Process, and a Process. When it combines with a State it has a 'change of state' function. In Lisu, the completed aspect marker 'woe' can combine with a Culminated Process or a Process, but not with a Culmination or a State. The change of state/new situation particle 'liu' can combine with a Culmination, a Culminated Process, and a State, but not directly with a Process. A Process has to be either given an end point or turned into a state,

eg. "ngwa le gwa gwu liu"

I as for me sing finish **change of state**

As for me I have finished singing now.

In this example the Process "sing" is given an end point by using "gwu" - "finish", then it can take "liu". Another example is:

"yi ame dza kyau" he now eat **progressive/change of state**

He's eating now

The Process "eat" is given the progressive meaning using "kya", which turns the verb into a progressive state, which can then take the change of state particle "liu".

The examples below illustrate the possible combinations of Situation aspect with Viewpoint aspect in Thai and Lisu. English has already been discussed.

Thai
Completed action function of laew

Process "Chan kin kao **laew**" I have eaten already
Culminated Process "Chan pai Leuy **laew**" I have been to Leuy already
Culmination "Rao jeu gan **laew**" We have met already"

Change of state function of laew

State "Muu rak Maew **laew**" Muu loves Maew now.

Lisu
Completed action - woe

Process "Ale te du **woe**" Ale has run already
Culminated Process "Yah hee sha **woe**" He has built the house already

Change of state - liu

Culmination "gii ma yi **biu**" (We) have reached Chiang mai now
Culminated Process "ngwa amyee gyi**u**" I go to the field now
State "yah seu **liu**" He understands now

OUTLINE OF RELEVANT RESEARCH

1.3.7 RESEARCH ON TEMPORAL SYSTEMS

In this section, I will review the literature that is relevant to the research on temporal reference systems cited in this thesis. I will first look at the more general, relevant, language development research, and then more specifically the research on temporal connectives, and tense and aspect.

I Perceptual salience of ends of units

From evidence based on cross-linguistic research, Slobin (1973), found that children have a tendency to pay attention to the ends of units, acquiring word final elements such as suffixes and post-positions earlier than word elements such as prefixes and prepositions. The research indicates a special salience for final syllables and clause final particles (Slobin 1985). Research on Turkish (Aksu-Koc and Slobin 1985) and Japanese (Clancy 1985), reinforce this finding. The data supports a perceptual bias favoring the ends of utterances, and sentence final particles. (Japanese has sentence final particles as does Chinese, and Lisu.) Japanese children have a tendency to omit morpheme particles which are "sandwiched" between familiar elements. Selective attention to the ends of units and to a lesser extent the beginnings of units, leaves medial position as the most vulnerable (Clancy 1985). This has interesting implications for Lisu with its clause final aspect particles. This possibly makes them perceptually salient to the young language learner and relatively easy to acquire. This is also relevant to the position for connective in the clause and the sentence in the three languages in the study. From this one would

expect clause final connectives to be more salient than clause initial connectives, and the least salient position would be mid-clause position. This is particularly relevant for the connectives 'before' and 'together' in Lisu, which have a mid-clause position in the Marble and Toy tasks (see Appendix 1). one would expect these two connectives in Lisu, to have a low performance score, because of this factor.

II Preference for overt, clear marking

It has also been found from cross-linguistic research, that overall children have difficulty with grammatical morphemes that are bounded, contracted, asyllabic, unstressed and varying in form in different environments, (Slobin 1985, Peters 1985). Slobin formulated the Operating Principle (OP), that underlying semantic relations should be marked overtly and clearly (Slobin 1973). Operating principles are suggested strategies for the perception, production and analysis of speech of first language learners. Errors which occur indicate that children acquire semantically empty or opaque forms late, prefer overt to zero morphemes, replace syncretic with analytic options where possible, and have difficulty acquiring discontinuous morphemes and interrupted linguistic units (Clancy 1985). In Japanese the critical deictic relations and the aspectual relations of completion and continuation are invariantly coded by readily accessible verb suffixes, and acquisition is precocious (Clancy 1985). In contrast in English, the important concepts of aspect are confounded with tense and obscured in the surface structure by discontinuous morphology involving auxiliary components and a verb suffix. Furthermore the auxiliary components have the same

form with other functions. As a result, the emergence of the event time system in English is relatively slow. Inflectional strategies for comprehending simple sentences develop early in Turkish - by 2;0 in the Slobin and Bever (1982) experimental study. Case inflections clearly identify grammatical roles of nouns, and are used consistently and productively in speech well before 2;0. However Turkish relative clauses are relatively opaque, and they are acquired late. A 1;1 correlation between form and function is preferred by children. This is reflected in the relative ease of acquisition of Mandarin Chinese (Erbaugh 1980), Japanese (Clancy 1985), as well as the early acquisition of Turkish case markings. This is of concern when comparing the ease of acquisition of terms in a semantic field. One would expect plurifunctional terms to be more difficult to acquire than unifunctional terms. This is a factor to be considered when comparing the ease of acquisition of a temporal term across languages. Also from this evidence, I would expect overall Thai and Lisu (analytic or isolating languages ie. languages with a tendency for each word to consist of just a single morpheme) to be acquired with greater ease than English (a syncretic language).

III Language specific learning strategies

One of the major aims of cross-linguistic research is to look at overall "universal" language learning strategies and language specific learning strategies. Children already at the two word stage produce sentences with characteristics of their language eg. Japanese constituents are postposed after the verb. This gives support for the view, that a capacity for processing

and storing sequential aspects of linguistic input may be inherent in the child's mechanism for perceiving and storing information, ie. a left to right processing strategy. In languages such as Turkish, where inflections are regular, but word order is much more variable than in Japanese, children are able to rely upon inflectional endings at an early age (Aksu-Koc and Slobin 1985).

In Japanese where the word order is more constant, it is apparently preferred over morphological strategies (case marking) at an early age (Hakuta 1982). In English, word order is very important. This is reflected in the errors which young children often make in interpreting passive constructions or embedded relative clause constructions. Children seem to develop distinct word order and inflectional strategies appropriate to the regularities of their language (Slobin and Bever 1982).

IV Completed versus non-completed events

An event that has already happened should be more firmly coded in memory and more easily retrieved and reported than an event that is still ongoing or merely hypothetical (Givon 1982). Events that have actually happened should be more salient for coding and retrieval than hypothesised events. Clark (1969) found for English that the markings for the past preceded those for the future. From this, perhaps the devices related to a state of irrealis (hypothetical or unrealised) are later acquired than the particles for "completed events" in Lisu, Thai and English.

Research on Temporal Connectives

Research suggests that several factors interact to explain the acquisition of terms within a semantic field (Keller-Cohen 1981):

(1) Restrictedness - the least restricted lexical items are acquired first, ie. the most general or broad terms are acquired first eg.'big and small', before 'tall and short'.

(2) Congruence - children often first learn terms which describe relations that are congruent with the perceptual strategies they employ, eg. children pay attention to movement towards rather than away from them, eg. Clark and Garnica (1974) observed the acquisition of 'come' prior to 'go'.

(3) Conceptual Simplicity - if the relation which one term describes requires a child to make fewer discriminations than some other term, the former can be regarded as conceptually simpler, eg. reference to one point in time (today, now) is learned earlier than reference to two points in time (X and then Y) (Clark 1973, Weist 1986). This idea has also been applied to the scope of a word, where it is assumed that the child will acquire first those aspects of the word, which the adult understands as general features, and then those features which are considered more specific (Clark 1971, 1972 , Johnson 1975).

For example **yesterday** and **tomorrow** are understood as meaning non-present initially, later the distinction between past and future is made, similarly for **before** and **after** which it is suggested are first understood as meaning non-simultaneous and later the two connectives are distinguished. Clark also proposed that words considered to have positive value by the adult are

acquired before those which have a negative value. This hypothesis predicts that **when** will be acquired prior to **before** and **after**, since **when** is depicted as being "+ time" and "+ simultaneous" which are considered to be more general features than **before** or **after**, which are depicted as being "- simultaneous" (Clark 1971).

However in contrast to Clark's theory, that duration precedes sequentiality, a philosophical analysis predicts that temporal order is a more basic concept than duration or simultaneity (van Fraasen 1970). Also Piaget (1966) discussed order and duration in relation to cognitive tasks and concluded that a sense of temporal order is acquired by children before a sense of duration.

Feagans (1980) using an acting-out comprehension task, found that temporal order (sentences with 'before' and 'after') were generally comprehended by children before the duration or simultaneous structure used, ('while' was used). Similarly Keller-Cohen (1981) found using an elicited imitation task that there were a significantly greater number of correct responses for sentences describing sequential events (with the connectives 'before' and 'after') than in simultaneous events (with the connectives 'while' and 'at the same time').

Using the three factors listed Keller-Cohen (1981) predicted the acquisition order of the following temporal connectives; **and, first, last, before, after, while** and **at the same time**. **And** ought to be the term learned first, because it is the least restricted, making reference to non-temporal relations, sequentially ordered events, and simultaneous events. It also permits descriptions

that are congruent with children's sequential processing of events (Piaget 1966) and it is conceptually simpler, since it does not require the child to clearly establish the temporal relations between two events. **First, last, before** and **after** are more restricted than **and** since they are more complex conceptually since the child must establish a temporal relation between two events to use these words. **While** and **at the same time** show some referential restrictions similar to **before** and **after** since they describe one temporal relation only. Unlike words describing sequential relations **while** and **at the same time** make reference to relations that are incongruous with the childs' strategy for perceiving temporally related events sequentially. Hence they ought to be learned later than **before** and **after** for example.

In English it has generally been found that **before** is understood before **after** by children (Clark 1970,1971, Johnson 1975). Some studies have found no difference between these words (Amidon and Carey 1972). Feagans (1980) found that **before** was performed better than **after** at 3 years of age, but at 5 years of age their was no difference. These differences in results found by researchers can perhaps be accounted for by the differing task features in the experiments, and/or the age of the children used (Stevenson and Pollitt 1977). Feagans also found that a "knowledge of duration" seemed to emerge at 5 years of age in simple and complex sentences containing the progressive, and a "knowledge of simultaneity" at 7 years of age in sentences containing **while**.

Feagans (1980) found that **until** (similar temporal function

to 'before') was better performed than **since** (similar temporal function to 'after'), but neither of these sentence types was performed above chance levels at any age level studied (5 to 7 years). **Until** and **since** were found to have late acquisition possibly due to their dual function of indicating order and duration.

Cross-linguistic research partially supports this outlined order of acquisition in that Clancy et al (1976) found **and** the first temporal term to be learned, preceding **before** and **after** in Turkish, German, Italian and English, ie. coordination (1;5 - 2;3) emerges before sequence (1;7 - 2;4) in spontaneous language. However the emergence of sequence and simultaneity are not so clear cut.

When seems to be the first subordinating conjunction to emerge, it first expresses a state or event sequence. A later development of **when** is the expression of simultaneity, ie. the description of two past events or states which overlap in time (Clancy et al 1976). It was found that examples of simultaneity emerged later in all four languages than **when** statements, which express sequence. According to Clancy et al (1976), the final stage in development of temporal conjunctions is the acquisition of **before** and **after** as adverbs earlier than they express notions of sequentiality. The children did not use them as conjunctions until significantly later. **After** used as a conjunction seems to emerge earlier than **before** in the English and Italian data, although in the Turkish data, **before** and **after** appeared at the same age.

Similarly in French 'quand', **when** is the first subordinating

conjunction to emerge. Also children first depend on an order of mention strategy for acting out sequences of events, then master the meaning of 'avant que' and only later 'apres que' (Ferreiro 1971).

In summary, research has found that children in their attempts to construct non-deictic relations of temporal reference, have been observed to employ the following strategies in an ordered fashion:

(1) juxtaposition of two independent clauses which express events in their order of occurrence,

(2) sequentially relating two clauses with adverbials which preserve the order of occurrence,

and finally

(3) free use of conjunctions or adverbials without any regard for correspondence between order of mention and order of occurrence. The child is able to relate the primary or deictic temporal reference system to a secondary or nondeictic one (Weist 1986).

PREDICTIONS ABOUT THE ORDER OF ACQUISITION OF TEMPORAL CONNECTIVES IN THIS STUDY

From the research reviewed the following prediction can be made: If an element operates on the meaning of a clause, it should ideally be placed outside the clause. This is pertinent to the connectives 'before' and 'together' in Lisu, which can be placed in the middle of the clause, preverbally, rather than outside the clause. From this one would expect children to have greater difficulty in processing these medial-clause connectives, in comparison to outside-clause connectives. The effect of position of connective in the clause or sentence, is examined and tested on the data in the Discussion chapter - (1) Syntactic Arguments.

According to research by Slobin and colleagues, one would expect plurifunctional terms to be more difficult to acquire than unifunctional terms. This is a factor to be considered when comparing the ease of acquisition of a temporal term across languages. In particular, "together" in English can be used to signify that two actors do an action simultaneously, but it can not be used to signify two actors doing two actions simultaneously, a different connective has to be used for this function, eg. "at the same time", "while" or "when" (in the E.I. task "at the same time" is used). However in Lisu and Thai the word meaning "together" can be used for both functions (the same word is used in all tasks). From Slobin's operating principal that 'one form : one function' is preferred by young language learners, one would predict that the English "together" would be easier for the child to acquire than the Thai or Lisu forms.

From examining the underlying functions (see also pages 36-

39 for the semantic descriptions) in conjunction with the research reviewed on semantic complexity of these connectives, the order of acquisition of temporal connectives in this study ("then", "before", "after", "when", "while", "until", "since", "together" and "at the same time") can be predicted and subsequently tested on the data collected from the three language groups. I will now outline the reasoning behind these general language predictions.

Sequence

"before", "after", and "then" have the same basic function; they are used to indicate the order of events. "before" indicates prior events, and "after" succeeding events. "then" does not have these specifications attached to it, it indicates simple sequence, it is less restricted and conceptually simpler, so according to this reasoning "then" should be acquired prior to "before" or "after". Research on the order of acquisition of "before" and "after" is contradictory. However generally the research on English has found that 'before' is better performed than 'after' (Clark 1971, Johnson 1975 and Feagans 1981 for age group 3 years of age).

"since" and "until" indicate both order and duration and so are relatively semantically complex. I would therefore expect "until" and "since" to be acquired relatively late. Feagans (1980) found in an acting-out comprehension task in English speaking children, that "until" and "since" had lower scores than "after" and "before", and even by seven years old performance was poor. She found that performance on "until" sentences was superior to "since" sentences. In English "since" sentences are

more complex tense-aspect wise than "until" sentences. I would expect "since" and "until" to be acquired relatively late, and as they both signal order and duration I would expect them to be acquired at about the same time in the languages of study.

Simultaneity

Research seems to indicate that sequence is generally acquired prior to simultaneity (Feagans 1980, Keller-Cohen 1981, Clancy et al 1976). However according to Keller-Cohen (1981), "together" is a word that is learnt early by children meaning "to do something with someone". Keller-Cohen found that her subjects scored high on this connective, all her subjects scored over 80% on "together" sentences. So I expect performance to be relatively high on "together" test sentences.

"when" is the first subordinating conjunction to emerge, it first expresses a state or event sequence, later it expresses simultaneity (Clancy et al 1978 in English, German, Italian and Turkish}. Recent research seems to indicate that sequence is acquired before simultaneity (Feagans 1980, Keller-Cohen 1981). **"when"** indicating sequence should be acquired before "when" indicating simultaneity. Research has shown that "when" constructions emerge prior to "before" and "after" constructions. So I would expect "when" indicating sequence to emerge prior to "before" or "after". However "when" indicating simultaneity should be acquired later than "before" and "after". Also as "when" indicating simultaneity has a similar function to "while" and "at the same time", I would expect these connectives to emerge at about the same time. A problem is that it is sometimes difficult to know when the child is interpreting "when" sentences

sequentially or simultaneously.

I will now summarise the predicted order of acquisition of the temporal connectives according to general semantic arguments.

"together" should be easily acquired and so have a high performance score.

Temporal connectives of sequence

"then" which indicates simple sequence should be relatively easy to acquire, and so should have a relatively high score.

"before"/"after" indicate order; prior and succeeding. The research which focusses on which of these concepts is acquired first is contradictory. The research on English on the whole seems to favour that "before" is acquired prior to "after".

Temporal connectives of simultaneity

According to research **"when"** indicating sequence should be acquired before "when" indicating simultaneity. "when" indicating sequence should emerge prior to "before" and "after" constructions, but "when" indicating simultaneity should be acquired later than "before" or "after". Also as "when" indicating simultaneity has a similar function to **"while"** and **"at the same time"**, I would expect these connectives to emerge at about the same time.

"until"/"since" indicate order and duration and so are conceptually complex and should have low scores compared with the other connectives. As they both indicate order and duration, I expect both connectives to be acquired at about the same time.

These general language predictions, which will be later tested on the data are summarised in Table 5 below.

TABLE 5 Predictions about the order of acquisition of the Temporal Connectives in this study.

(1) "**together**" has a high score in all languages in the Marble and Toy tasks
(2) "**then**" has a relatively high score in all languages and all tasks.
(3) **Sequence** is acquired before **Simultaneity**
(4) "**then**" has a higher score than "**after**"
(5) "**then**" has a higher score than "**before**"
(6) "**before**" has a higher score than "**after**"
(7) "**when**" has a higher score than "**before**" **or** "**after**"
(8) Scores for "**when**"**(simultaneous)**, "**while**" **and** "**at the same time**" have similar scores.
(9) Scores for "**since**" are low
(10) Scores for "**until**" are low
(11) The scores for "**until**" and "**since**" are similar.

Even though these predictions are very simplistic, they serve a purpose for testing and analysing the data collected on the three languages of this study. I will first test the data for these general language trend predictions. These predictions are examined further in the Discussion chapter. If the data does not conform to these predictions, then I will look at possible semantic, language specific explanations for the results, such as the effect of task sentences on the different connectives, the variation in scope or range of meaning that a connective has in the different languages, and the role of pragmatics.

TENSE-ASPECT

I will review the stages in development of the acquisition of tense and aspect in the literature.

The first stage of linguistic development
Pre-inflectional period or "here and now" stage (about 1;0 to 1;6 years).

This stage is characterised by the lack of overt marking. Children's utterances serve an instrumental-directive function (where the child names either the goal of his desire or the means leading to the goal) as well as a declarative function. This has been observed over many languages (Aksu-Koc 1988). Depending on language type, children's first verbal forms are either imperatives or infinitives. The child is confined to the here and now and to his feelings connected to his actions. Temporal reference is limited to the present moment. Weist (1986) using Reichenbach's framework has proposed that ET and RT are frozen at ST during this stage, ie. ET = RT = ST. This is termed the "here and now" stage by Weist.

However post sensori-motor children are able to evoke objects in their absence and to reconstruct past events or actions from memory, but this ability does not allow children to linguistically encode this information.

Second Stage
Inflectional stage or Event Time System (about 1;8 onwards)

This stage is characterised by overt marking of the semantic distinctions between modalised and nonmodalised utterances. In English the first inflections that emerge are the progressive "ing" and regular past inflections "-ed" as well as some irregular pasts (Brown 1973, Bloom, Lifter and Hafitz 1980). Use of the future in languages studied so far is not common.

In addition to imperatives and infinitive forms, there are quasi-modals in English such as "**wanna**", "**hafta**", occasional use of "**won't**", "**can't**", "**will**", and "**can**" (Fletcher 1979). A common observation is that forms occur in rather restricted environments. Inflections that indicate tense-aspect in adult systems are reported to occur only with certain types of verbs (Antinucci & Miller 1976, Bloom, Lifter & Hafitz 1980). Harner (1975) found correct comprehension of these forms around 3;0 years.

In Mandarin Chinese this stage (1;10-2;4), is characterised by a distinction between stative and dynamic verbs, and the initial coding of perfective aspect with the verb suffix "**-le**". Children also indicate completion with the verb complements "**hao**" "good" and "**-wan**" "finish" in conjunction with "**-le**", eg. "jiang **wan-le**". Speak finish PFV. I've finished speaking. The perfective aspect is used by Chinese children with activity verbs (atelic) eg. "cry" as well as telic verbs eg. "come". There were only a few instances of the progressive aspect observed. Concepts of 'complete' and 'ongoing' are the first to be encoded (Erbaugh 1982). From 2;6-3;2 years aspectual marking is still centered around perfectives, with duration of an event, iterative, habitual and generic all unmarked in Mandarin Chinese.

The first use of inflections has a very narrow temporal scope, where children mainly talk about entities or situations of the here and now. However this does not imply that the child lacks the cognitive capacity to reconstruct objects or events of past experience from memory.

Stage 3 Temporal Reference Stage (about 2;6 onwards)

This is the first stage at which the research cited here, is concerned.

In English children there is a more variable use of the progressive and past forms (Fletcher 1979). '**will**' and '**going to** ' are used for future reference together with adverbials, which strongly suggests that they now carry tense as well as modal value (Harner 1975,1976). The late emergence of future markers appears to be common among several languages (Aksu-Koc 1988). There is a gradual increase in use of adverbials. Fletcher (1979) observed temporal adverbials and complement construction with 'when' in English around 2;6 years. This usage of '**when**' for establishing reference time was observed in Italian, German and Turkish at about 2;8-3;0 years (Clancy et al 1976) in French about 3;0 and Spanish about 3;6 years (Clark 1985).

In Mandarin Chinese the use of these forms was noted to occur during the course of the third year (Erbaugh 1986). Temporal adverbs occur as early as 2;2 in Mandarin Chinese and increase in frequency from 2;2 years to 3;2 years (Erbaugh 1982). In all reported languages the use of deictic temporal adverbs and when -construction are reported to precede the use of '**before**' and '**after**' (non-deictic adverbs marking anteriority relations between ET and RT) both prepositionally and as subordinating conjunctions. According to Weist (1986) at this stage, children can represent ET prior and subsequent to, as well as simultaneous with ST, RT is seen to remain frozen at ST (RT=ST), and so Weist calls it "the Event Time system".

In English children's speech there is a relatively late

emergence of reference to hypothetical situations compared to other languages. This seems to indicate that this is due to the structural complexity of the language rather than to the cognitive complexity.

Fourth Stage - Complex Temporal Reference (about 4;5 onwards)

This stage is characterised by the marking of more complex meaning relations, and the use of more complex syntactic structures (Aksu-Koc 1988). Children at this stage seem to be involved in the construction of the non-deictic system of temporal reference, which involves relations of anteriority, posteriority or simultaneity between ET, RT and ST. Children can establish a sequential relationship between two events at different time points and posit this to be either anterior, posterior or simultaneous to the moment of speech, by means of complex tense-aspect marking (eg. pluperfects, future perfects) and use of temporal adverbs prepositionally or for subordination. For English this means the emergence of the full perfect, modals like '**may**', '**must**', '**ought to**', past tenses of 'be' forms, past tense of modals (like **should**, **should have**, **might**), and rare use of counterfactual conditionals.

The relatively late emergence of the English Perfect has been explained on both semantic and syntactic grounds. The English perfect can indicate that the activity of the verb begins earlier and continues right up to the present, and also it can have the meaning of 'current relevance' which indicates that the activity, while not necessarily extending over the period of time to the present, is nevertheless relevant to the speaker at the present time. In the use of the present perfect, RT is

independent from, but simultaneous with ST, and ET is prior to both. Furthermore ET must have current relevance to the present moment.

In Mandarin Chinese 'le', a separate sentence final particle, which signals current relevance, emerges at a relatively early age of about 2;0 to 2;4 years compared to English. But these precocious uses appear to be for the simpler function of directing the attention of the listener to a current state. Also in English, the perfect 'have' has different realisations in various syntactic and phonological environs, which probably contribute to its late acquisition, in addition to the cognitive complexity of the notions involved (Cromer 1968).

Notions of verbal aspect are not only highly accessible to the child, but they are so close to the meaning of the verb itself, that children quickly learn to combine both meaning and aspect in a single form, easily learning separate forms for separate aspects. However, according to Slobin (1985) tense, negation and person are apparently not inherently part of the verb meaning for children, as we find in early errors in Japanese (Clancy 1985), Slavic and Romance languages (Spanish Clark 1985).

Notions like tense and negation affect the meaning of the entire clause, not just the meaning of the verb as aspect does. Children are sensitive to this 'scope or range' of operation of grammatical elements, that is if an element operates on the meaning of a clause, it should ideally be placed outside of the clause, and should not alter the internal form of the

clause, eg. negation wherever possible children will move negative elements; learning verb forms and word order intact eg. Turkish (Aksu-Koc and Slobin 1985) and Japanese (Clancy 1985), where negative particles are sometimes placed inside the verb, the children tend to move these particles to the end of the clause, following the standard verb final order of these languages eg. for Japanese the following form is adopted, ie.

Verb + Past + Negative instead of the grammatically correct form; Verb + Negative + Past.

Similarly for Turkish the following form is adopted:

Verb + Tense + Person + Negative rather than;

Verb + Negative + Tense Person.

There is a preference to keep grammatical markers of aspect, tense and person close to the verb, while keeping negation and conditionality peripheral, ie. morphemes that go together semantically should be placed together, with aspect closest to the inherent meaning of the verb, tense and person more distant and negations and modalities such as conditionals the most distant (Slobin 1985).

<u>The Aquisition of Aspect before Tense Debate</u>

Bronckart & Sinclair (1973) argued that children who are in Piaget's preoperational stage are not likely to have mastered the abstract relational system underlying verb tense distinctions. Instead children are commenting on an aspect of the action, such as its completedness. They found in French speaking children (2;11, to 8;4 years), from elicited descriptions of past actions, that children were more likely to use a past tense if the action had a clear goal or ending point (telic event) than if it did not

(atelic). Children up to 6 years generally used present tense to describe a continuous past action that had no extrinsic goal or ending point (eg. a duck swimming around in circles). However older children (7 and 8 years) used past tense in both types of action. Bronckart & Sinclair concluded that since children first used past tense to indicate only goal orientated, completed actions, the children could not be said to understand the notion of pastness until they were using past tense for both continuous, non-goal orientated actions and completed, goal orientated past actions. According to this view children first use past tense not to order a past action as prior in relation to the moment in which they speak about the action, but instead to comment on an aspect of the action, such as its completedness. Antinucci & Miller (1976) found from spontaneous production data from Italian children (and one American child) (1;6 to 2;6 years) that these children never used activity (atelic) verbs in the past tense to refer to actual prior situations. Bloom, Lifter and Hafitz (198?) using spontaneous production data also found in four English speaking children (1;10 to 2;6 years) that they used past tense forms only under certain specified conditions rather than applying the past forms to all instances of appropriate past reference.

However in contrast, Kuczaj (1977) worked with 15 English speaking children (2;6 to 5;6 years) and found that these children were able to use past tense to refer to a variety of past events and not just to completed ones with observable end results. Di Paolo & Smith (1978) studied 28 English speaking children (4;7 to 6;6 years) and also found that these children

were using past tense regularly for both goal-orientated and non-goal orientated past actions. Their conclusion was that these children had a basic understanding of temporal relations inherent in the concept of 'pastness'. Harner (1981) used elicited descriptions of past actions in 100 children (3;0 to 7;11 years). The methodology was similar to Bronckart & Sinclairs' (1973). Harner's results did not agree with Bronckart and Sinclair's conclusion that children who are preoperational are relating to aspects of actions rather than to temporal relations. According to Harner by the time children are 3 years old, they are using past tense for both goal orientated and non-goal orientated past actions.

A study by Sachs (1983) indicates that the age difference can account for the divergent findings. Sachs found that although the very earliest instances of past reference were to events with evident end results (1;8 to 2;1), by 2;2 years reference to nongoal orientated past events had appeared.

Aksu-Koc's (1988) view is that inflection enters a child's system at first with a single function and gradually acquires a multifunctional status. Once situation aspect (class) is discovered and consolidated in standard ways with choice of appropriate lexical items, the inflections gain a deictic temporal function with subsequent development. When children make non-standard choices of linguistic forms in talking about given situation types, the same forms come to express different perspectives, presenting an event as a state or vice versa.

The overall data and research seems to indicate that although the earliest use of past verbs may encode aspectual

distinction, English speaking children are able to use past tense well before 3 years to encode temporal relations.

When a situation is conceptualised from an external perspective, properties such as 'complete' and 'punctual' and 'resultative' are salient, and when conceptualised from an internal perspective, properties such as 'ongoing' (continuative); 'duration' and 'incomplete' are prominent. The acquisition rate will depend in part on the manner in which aspect is coded in the surface of the language. In Japanese where the critical deictic relations and the aspectual relations of completion and continuations are invariantly coded by readily accessible verb suffixes, acquisition is precocious (Clancy 1985).

In contrast, in English the important concepts of aspect are confounded with tense and obscured in the surface structure by discontinuous morphology involving auxiliary components and a verb suffix. Furthermore the auxiliary components have the same form with other functions. As a result the emergence of the event time system in English is relatively slow.

Givon (1984), has predicted from psychological research that completed events should be easier to recall than still ongoing, incompleted ones. A sharp terminal boundary should be easier to code and recall than a diffuse one, (Clark and Clark 1977).

PREDICTIONS ABOUT TENSE AND ASPECT IN THIS STUDY

In Lisu aspect is invariantly coded by readily accessible clause final particles, so one would expect the acquisition of the aspect system in Lisu to be precocious. One would expect the English Aspect system to be slow in acquisition compared with Lisu or Thai Aspect systems, due to its more complex surface realisation. Semantic analysis should be facilitated by languages which have distinct morphological marking for tense and/or aspect. One would expect the acquisition of tense and/or aspect to be precocious in such languages. This should facilitate the acquisition of aspect in Lisu and Thai.

In Mandarin Chinese, which has similar properties to Lisu and Thai (see Introduction Chapter, Section 1.2), there is an early emergence of the progressive and the perfective. 'le' indicating a current relevant state emerges early, so I would expect 'laew' in Thai and 'woe' in Lisu to emerge at a similar early stage. In English the present perfect is acquired relatively late due to its complex surface realisation and semantic role. It would be interesting to see if these differences are reflected in the Thai, Lisu and English data.

It is also of interest to see at what stage the English children in this study acquire past tense to encode temporal relations. Do they use past tense for both continuous, non-goal orientated (atelic) and for completed goal orientated (telic) past actions? This will be examined in the Conversation material.

CHAPTER 2 - LANGUAGE SOCIALISATION OF THE CHILD

In this chapter I attempt to describe and outline the social and cultural environments of the different language groups in this study. The reason for studying language from a social aspect is that language is acquired in a social world, and the linguistic structure or cognitive development cannot be studied in isolation from the social context in which it is learnt and used. I will first review the literature and then outline the research carried out in this study.

2.1 Review of the Literature

Many of the studies looking at the language environment of the child have focused on the language of the caregivers, in particular how caregivers speak to their language acquiring children (eg. Sachs and Devin 1976, Snow 1972, 1973). Research has strongly emphasised the importance of adult-child interaction in the prelingual period and during subsequent years. The dyadic relationship between mother and child has been focused on as the context for children's discovery of phonology, syntactic, semantic and functional aspects of language, (Halliday 1975, Newport, Gleitman & Gleitman 1977, Bates et al 1979). These studies indicated not only that adults use well-formed speech with high frequency, but that they modify their speech to children in systematic ways as well, which is known as the baby-talk register or motherese. The baby talk register is characterised by its use of a high pitch, exaggerated and slowed intonation, reduplication of words, simple sentences, shorter sentences, interrogatives, talk about the "here and now", play and politeness routines (Newport 1976, Corsaro 1979,

Gleason and Weintraub 1976, 1978), and expression of one's own and the childs' utterances. In particular, caregivers simplify their speech in addressing young children. The scope of the effects of use of this language register on grammatical development have been focused on by researchers eg. Snow (1977), and Wells and colleagues (Wells 1981). Several studies have demonstrated that caregivers speech only facilitates the acquisition of language specific features, but not those features widely, or universally shared across languages (eg. Newport et al 1977).

The importance of adult-child discourse for the development of displaced speech ie. for talk about non-present entities and events ie about past or future events is considered to be of vital importance by some researchers and has been analysed accordingly. According to these researchers children's conversations are at first elicited and maintained by the adult. Gradually the child's performance becomes more autonomous and they begin to talk about past events without adult aid. There is increased complexity in adult-child discourse which proceeds from intersentential to intrasentential (Ochs et al 1979, Sachs 1979, Aksu 1978, Keenan 1974). Until about 2;6 children appear to be heavily dependent on scaffolding provided by adult questions, while by the end of the third year they start to refer to a wider scope of past events independently of discourse and situational context (on Spanish Eisenberg 1985, on English Sachs 1983). Up to about the age of 2 a child's strategy of maintaining discourse with an interlocutor is imitation and repetition and by answering certain kinds of adult questions

(Berman et al 1981, Keenan 1974, Ochs et al 1979). All this research supports the view that Tense and Aspect are acquired in the course of discourse with adults.

However these researchers focused mainly on white middle class caregivers, who see their infants as sociable and capable of intentionality. However how caregivers and children speak and act towards one another is linked to cultural patterns, that extend and have consequences beyond the specific interactions observed, ie. linked to how members of a given society view children and to how members think children develop (Ochs and Schieffelin 1986). According to Ochs and Schieffelin we must study the language of caregivers primarily for its socialising functions rather than for only its strict grammatical input functions and also examine the prelinguistic and linguistic behaviors of children to determine the ways they are continually and selectively affected by values and beliefs held by those members of society who interact with them.

The characteristics of Anglo-American white middle class caregiver-child interaction are that they are dyadic rather than multi-party and from birth on the infant is treated as a social being and as an addressee in social interactions. Protoconversations are established and sustained along a dyadic turn-taking model. In other words caregivers treat very young children as communicative partners. The caregiver takes the perspective of the child and accommodates to the young child, which according to Ochs and Schieffelin has the effect of "keeping the child dependent on, and separate from the adult community for a considerable period of time". (Ochs and

Schieffelin 1986). The child is protected from those experiences considered harmful (eg. playing with knives, climbing stairs) is thus denied knowledge, and his or her competence in such contexts is delayed.

I will now consider the Kaluli case as studied by Schieffelin (1979, 1981, 1985). Kaluli society is a nonliterate, egalitarian society. Learning how to talk and become independent is a major goal of socialisation of Kaluli society. Being able to talk well is a highly valued trait. Mothers, the primary care-givers are attentive to their infants, and physically responsive to them. Whenever an infant cries it is offered the breast. While nursing her infant, a mother may also be involved in other activities, such as food preparation, or engaged in conversation with others. Mothers never leave their infants alone, and only rarely with other caregivers. When not holding their infants, mothers carry them in netted bags, suspended from their heads.

Kaluli mothers describe their babies as helpless and having no understanding, and given this belief they never treat their infants as partners in dyadic communicative interactions. A mother and infant do not gaze into each others eyes, which is consistent with the adult accepted pattern of behavior in social interactions. Rather than facing their babies they face them outward, so that they can see and be seen by other members. When the child is greeted by an older child, the mother responds for the child in a high pitched, nasalised voice. These triadic interactions are common. The language used by the mother is well-formed and appropriate for an older child, only the

nasalisation and high pitch mark it as "the infants". This continues until the child is 4-6 months of age. Every society has its own ideology about language; including when it begins and how children acquire it. Kaluli claim that language begins when the words 'mother' and 'breast' are used.

In contrast Samoan society is a highly stratified society (Ochs 1982, 1985). From birth until the age of five to six months the infant stays close to his or her mother, who is assisted by other women. Language addressed to the young infant tends to be in the form of songs of rhythmic vocalisation in a soft, high pitch. Infants at this stage are not treated as conversational partners. For the Samoan child multiparty conversations are the norm, and participation is organised along hierarchical lines. Very small children are encouraged to produce certain speech acts, that they will be expected to produce later as younger, low ranking members of the household. Caregivers tend not to guess, hypothesise or interpret unintelligible utterances and acts.

In summary the Kaluli and Samoans do not simplify their speech to very young children. They do not do so for different cultural reasons. The Kaluli do not simplify because such speech is felt to inhibit the development of competent speech, the Samoans because such accommodations are dispreferred when the addressee is of lower rank than the speaker (Schieffelin and Ochs 1986).

Schieffelin and Ochs (1986). have suggested that there are two differing ways of rearing children - adapting the situations to the child as predominantly shown in the Anglo-American case

and adapting the child to situations predominantly as shown in the Kaluli or Samoan case. These two ways of rearing children shift as children develop eg. a society may adapt situations to meet the needs of a very small infant, but as the infant matures, the expectations may shift to one in which the child should adapt to situations. The distinction between societies is in terms of when and to what extent the shift takes place. Schieffelin and Ochs also predict that a society that adapts or fits situations to the perceived needs of young children will use a register to children that includes a number of simplifying features and the caregiver taking the perspective of the child. On the other hand, societies in which children are expected to meet the needs of the situation will communicate differently with children. In such societies, caregivers socialise children through language to notice others and perform appropriate speech acts towards others.

Societies differ in their expectations of what children can and should communicate (Hymes 1967), and in what situation and context can these expressions be used. The young language acquirer must attend to the societies system of norms, in the process of growing up to be a competent language user.

It appears from the Kaluli and Samoan examples, that the specific features of caregiver speech behavior that have been described as simplified register are neither universal nor necessary for language to be acquired. White middle class children, Kaluli children and Samoan children all become speakers of their languages within the normal range of development and yet their caregivers use language quite

differently in their presence. It is interesting to compare Lisu and Thai societies with the Samoan, Kaluli and Western models.

2.2 Research Methodology

An Ethnographic methodology was used to collect information about the language socialisation of Thai and Lisu children throughout my stay in the village. The methodology used was based on one of informal questioning and participant observation. As Spradley (1980) has suggested broad descriptive observations are first made, then after recording and analysing the initial data the research is narrowed and more focussed, selective observations are made. Slobin and colleagues (1967) in their field manual formulated a questionnaire to be used for interviewing adults to ascertain views, beliefs and attitudes about the language of children, to gain a view of the language environment of the child in different communities. These questions (see Appendix 2) were used as a broad guideline for collecting information about the beliefs/attitudes of child rearing and language development in Thai and Lisu Societies. The questions were constantly referred to and updated during my stay in the village. For the Thai information, Psychiatrists/ Psychologists were also used as informants as well as mothers of small children. Mothers of small children were mainly questioned, because they are the primary caretakers, and are most familiar with their children's behaviour. Also women in the societies of study respond most to someone of the same gender. Similarly the men would respond best to a male researcher. In this type of research one has to be aware that what people say they do is often different from what they actually do (Whiting

et al 1966). In collecting this information I also referred to the literature available on Thai and Lisu societies.

Below I summarise the information on Thai and Lisu societies. This summary description of Thai and Lisu societies is extracted from the information collected from observations and questions, which I carried out while living amongst these societies, and also from the literature available on these societies.

2.3 THE CHARACTERISTICS OF THAI AND LISU SOCIETIES.

Lisu Society

Lisu society is a nonliterate, egalitarian society, with traditionally no headman to make decisions for the rest of the village. Kinship is based on a system of patrilineal clans, ie. with lineages maintained through the male line. Each lineage in a village has one or two senior people, usually older men who are acknowledged for their wisdom and ability to influence others. When conflicts arise, this group has the duty of arbitrating and settling the dispute through consultation, (Chaipisusit 1989). At communal meetings problems are discussed and discussed until an obvious answer emerges (Morse 1974). Women have a relatively equal status with men, especially when compared to other hilltribes in the north of Thailand and many household tasks are shared by men and women. Lisu are animists who practice certain forms of ancestor worship and exorcism (Young 1969).

Cultural and environmental background of the child

Lisus live in bamboo-slat wall houses with thatched grass roofing and hard-packed dirt floors with only basic furnishings

and equipment. Even though they now live in Thailand they still live in a traditional Lisu way. They grow upland rice, which is their staple food, corn and other crops. They also forage and hunt for food in the surrounding forest. Traditionally they live in the highlands and have grown opium, mainly as a cash crop, but this has changed due to various crop substitution programs initiated by the Royal Thai Government. Lisu traditionally rear pigs, which are essential for many of the ceremonies and rituals in their daily lives. Lisu are a proud and hard working people. Besides farming activities, the men are also very skilled as silversmiths, they make decorative jewellery, knives and axes. The men also make musical instruments in their free time. The women are very industrious and spend their spare time sewing cloth, sometimes to be sold in the town. Traditionally the lifestyle of the Lisu is a very tough, harsh life and previously it has been survival of the fittest. Previously there has been a high infant mortality rate. Some of the Lisu work in the Thai towns, in the tourist industry, performing dances with musical accompaniment. Other work includes labouring and acting as guards. Often the pay and conditions are poor compared to the Thais.

The particular village where I collected most of my data, is not remote, it is only 50km from Chiangmai, the main northern town and is next to a Thai village. It is only 10km along a mud track from the main sealed road and is readily accessible by public transport. The Lisu have a lot of business exchanges with northern Thai and also other tribal groups. In particular the men are well-travelled and can speak Thai, whereas some of the

women cannot speak Thai. Many of the children, 6 years upwards now go to the local Thai school and can speak some Thai, but at home they speak Lisu. Depending on the level of schooling some Lisus can also read and write Thai. Lisu is not a written language.

The Lisus train and encourage their children to use their ability to reason and express themselves in front of elders. Children are expected to speak in a forthright manner, not to give in easily, and if they feel that they are right, to keep after a point until it is accepted or shown to be suspect or false. Both boys and girls speak their minds especially on matters concerning values and rights. They do not readily admit that one of their peers is more important than they; everybody is supposed to be equal. Within the family children are taught not only to which lineage they belong but what they can expect from it as well as their duties towards each other. They learn who belongs to their lineage and to treat these people as family, and give support where needed (Chaipigusit 1989).

Lisu mothers initially look after the infant and gradually as the infant gets older and less dependent on her, other caregivers help look after the child, especially if the mother gives birth to another baby, or has to work in the fields.

Caregivers are attentive to their infants and physically responsive to them. Infants are often carried around on the caregivers front or back using a length of cloth. Apparently one of the first words a child often says is the word meaning "to be carried on the back". A common way of carrying the infant is to tie the infant on the back with a length of cloth. Carried

in this position the infant can see what is happening around him or her and the caregiver can easily attend to the infant's needs. This also allows the mother/caregiver to get on with other household tasks or work in the field.

Lisus will often imitate the sounds produced by a prelinguistic infant, and so encourage the infant to respond further and develop turn-taking skills. If the infant cries he/she is immediately responded to. They are always being held or carried. The baby/infant is emersed in Lisu life, he/she is a part of the ongoing daily activities.

Children are normally expected to be fairly self reliant and independent and to quickly learn what is acceptable and unacceptable behavior in Lisu society. I have seen 2/3 year olds playing in the pond without adult supervision, and young children using large knives, and lighting fires for cooking. Young children are often seen in loose groups or by themselves roaming around the vicinity of the village. Older children often look after younger children.

Lisus are quite strict towards their children and if they are disobedient they either threaten or hit them with a stick or branch. However they do not punish them until they are at least 2 years old when "they can understand that they are doing wrong".

The preschool children often play around the village either in groups or individually loosely supervised by adults not working in the fields. They play games with sticks, stones, elastic bands, large round seeds called 'gae gae' and marbles. The children also spend a lot of time playing in the large pond,

which is used for bathing in the evening after working in the fields. They are expected to help with household activities from an early age.

Lisu Calendar and temporal view of the world

The Lisu traditionally have a 12 day week. Each day is represented by an animal, and certain days are more propitious for carrying out certain activities eg. buying a pig. During the Lisu week on one day Lisus are not supposed to do hard manual work. New Year is celebrated at the same time as Chinese New Year. The calendar year is viewed in terms of the crops which are to be planted or harvested, rice the staple diet is seen as particularly important. The year is also seen in terms of the seasons ie cold, rainy and hot seasons and the lunar calendar is of importance. The day is seen in terms of position of the sun in the sky.

Thai Society

Thai society is a hierarchical society, with status of paramount importance in social interactions. It is very important for a Thai to know his or her relative status in relation to others, so that the right degree of respect can be given or received. This allows interactions to run smoothly. These characteristics of Thai society are reflected in the language, there are different levels of politeness depending on the context and status of the person being addressed. Thai culture has been described as one in which "outside appearance is taken to be the essence of life", (Mulder 1985). From an early age in the first year of life prelinguistic children are

encouraged to produce the 'wai'. The 'wai' is given when meeting someone, it consists of clasping the palms together in front of the body. The level or height of the 'wai' given indicates the relative status of the participants in the exchange. The higher the 'wai' the more respect that is being given. The status of the person depends on such factors as age, position, and wealth of the individual. However these finer distinctions of the 'wai' are not important for the child until later, as the child, in interaction with an adult is automatically of a lower'status' and the 'wai' given by a child is not traditionally reciprocated. Children are expected to show a high degree of respect to their elders.

Thai children are not generally encouraged to be independent or autonomous. Adults do not generally allow children to be independent or to do things by or for themselves. Individuality is not encouraged. Adults help the child all the time and do most things for the child. They are often for example spoon fed until they are three, four or even five years old. Consequently Thai children are often shy, quiet, very wary of strangers, rarely smile and often do not respond when addressed by an adult.

Adults generally expect children to be well behaved, obedient, clean, smart, polite, respectful and quiet ("riap roy"). Parents can also be quite strict with their children. The most common punishment is to be hit if the child does not obey the parent. Clear reasons for punishment are not normally given. Sometimes ghosts or 'farangs' (white foreigners) are used as threats to children, so that Thais later on are often frightened

of ghosts, and of being alone at night.

If a Thai baby cries the infant is responded to immediately. They sleep with their parents. The Thai child's essential needs are looked after. They are very well protected. Generally the prelinguistic child is not talked to a lot or played with. They are carried or rocked in a cradle for a large part of the time. They are not treated like a communicative participatory partner. The noises the prelinguistic infant makes are not generally responded to, or imitated (especially putting the tongue out of the mouth which is considered rude). Often the prelinguistic Thai child seems very quiet. The linguistic child is also quiet and often they do not respond when addressed, or participate in polite routines, eg. the 'wai'. They are often given commands rather than questions. Their behaviour and language is corrected a lot by Thai adults. The prevalent view is that you need to teach language and correct mistakes. Polite routines are taught to children eg. the 'wai' routine, a means of addressing someone.

The socialisation of the child is continued and reinforced by the Thai Education system. Thai parents are fairly lenient to their children until they go to school, when their expectations of the child increase. The teacher is a very respected figure in Thai society, as the traditional teachers used to be monks. Children are expected to be respectful, polite, obedient, smartly dressed and not question the teacher. The degree of respect endowed on the teacher is reflected in the special day called "Wan Kruu" (Teachers day) when the students traditionally crawl on hands and knees and bow to the teacher

who sits in an elevated position, to have "Saesan" (ceremonial string) tied around their wrists. The teaching method relies heavily on drills, chants and rote learning. Creativity or individuality is not encouraged.

There is a wide variation in Thai child rearing but generally infants are not talked to, stimulated or played with much. They are not allowed to explore or do things for themselves. The Thai child is expected to be "riap roy" i.e. well-behaved, smartly dressed, respectful and quiet. However all their basic needs are catered for.

Thai Calendar and Thai Temporal view of the world.

Although Thailand has been exposed to western influences, it still maintains a strong Thainess. Thais celebrate their own Thai New Year (Songkran) as well as western New Year, Chinese New Year and Ramadan, the Moslem New Year. Thais have a different view about time than the predominant western view. They are more flexible and less time conscious. There are obviously rural vs town differences. The data was collected in a rural area. I found that the pre-school nursery children were more willing to converse than the school children. This is probably the effect of the Thai educational system inhibiting the school children.

Thai children are generally exposed to a wider range of experiences than Lisu children, this includes western culture, partially due to television and travel. Thai houses have more furniture and modern equipment than a Lisu house, though generally in the village not to such a great extent as western houses. Also Thai children have greater access to toys and other

possessions than a Lisu child has. They usually speak central Thai as well as the local northern Thai dialect. They all go to school and possibly nursery school too.

2.4 A COMPARISON OF VALUES, ATTITUDES AND TREATMENT OF THE LANGUAGE LEARNING CHILD IN THAI, LISU AND ENGLISH SOCIETIES

In the Table below, I have summarised the main findings from this review of Thai and Lisu societies, and made a comparison with English society.

TABLE 6 VALUES AND ATTITUDES ABOUT CHILD REARING AND LANGUAGE SOCIALISATION OF THE CHILD IN THAI, LISU AND ENGLISH SOCIETIES

	THAI	LISU	ENGLISH
Characteristics of the Society	hierarchical status	egalitarian	class conscious
	literate	non-literate rely on word of mouth	
	traditionally communal	live communally	nuclear family
Child centered?	no	no	yes
Child Care			
Attentive to infants physical needs?	yes	yes	not as attentive
Respond immediately to infant cries?	yes	yes	not always
Means of carrying	arms	length of cloth	pram
Infant sleeps where?	with mother	with mother	Often in separate room
Breastfeed?	varies	yes	varies
Other caregivers?	grandmother	relatives	varies
Play with infant?	no	yes	yes

	THAI	LISU	ENGLISH
Expectations about child's behaviour	to be 'riap roy'	help parents	to be well behaved'
Child respects elders	very important	quite important	quite important
Expect child to look after self from an early age	no	yes	no
Expect child to help parents from an early age	no	yes	no
Values & Attitudes about language			
Importance of the ability to speak well	not important	very important	generally important
The Prelinguistic Infant			
Treated as a comm -icative partner?	not generally	yes	yes
Iimitate child's utterances?	not generally	yes	yes
Linguistic Infant			
Adapt speech to the child?	teach politeness routines	-	yes
Correct child's language?	yes	-	yes
Child unresponsive when addressed?	yes	not generally	not generally
Adult responds for child?	often	no	no
Have to teach child language?	yes	no	yes
Importance of polite language	very important	not important	important
Language games and nursery rhymes?	not used often	no	yes

(- indicates that this information is not known)

2.5 Discussion

From this brief summary in Table 6, we can see that there are some quite marked differences in the way children are reared and thought of with respect to language in the different societies of this study. I have made a lot of generalisations, however certain patterns or trends do emerge. In summary, Thais tend to value highly polite language routines and behaviour. The child should ideally be "riap roy", smart, respectful, obedient and polite. They should be very respectful to their superiors and elders. This is very much reflected in the hierarchical status consciousness of Thai society. Children are not generally encouraged to be independent, in fact dependency is encouraged. Children are often shy or unresponsive when addressed and adults often respond for the child. Prelinguistic infants are not generally treated as communicative partners, adults do not generally pay a lot of attention to the utterances made by the prelinguistic infant, and they do not generally imitate or encourage the child's utterances. Also adults do not generally adapt their language to encourage the child to speak, although certain words are simplified, eg. "mam mam" meaning "food". They use commands rather than questions, when talking to a language learner and they often also correct and monitor the child's language and behaviour. Adults do not generally play or stimulate the infant. Individuality and independence are not valued traits in Thai society. This is very much reflected in the Thai educational system. However the infant's physical needs are looked after. It is very important for a Thai person to fit into and function in Thai society by learning his or her

relative status with respect to others and to use the appropriate degrees of politeness and behaviour, so that social interactions appear to run smoothly.

Lisus tend to value the ability to be able to make decisions and speak well. Lisu society is a non-literate society, so it is important to be able to communicate and express oneself well vocally. It is largely an egalitarian society and younger people generally are encouraged to express their own views and opinions. Children are encouraged to be independent, and speak for themselves. Lisus generally treat the child as a communicative partner, imitate and play with the infant's prelinguistic utterances. They also value the trait of being hard working. Traditionally they have a harsh way of life, reliant on growing crops at high altitudes. The young infant must go with the mother in her everyday activities. Caregivers help especially when the infant is more independent from the mother. The infant grows up to fit in with what is going on around him or her. When Lisus meet, they tend to talk directly without polite openers or polite means of addressing the other person, in contrast to Thai society.

English society is described as child-centered, ie. the behaviour of the parent and the environment are adapted to what are the perceived needs of the infant. Often a separate room is set aside for the infant, and separate household items are acquired for the child. Family activities are often centered around the interests of the child. There is a whole sub-world built round the child and his/her perceived needs. According to researchers, language is adapted to the child and a special

language register is used with language learners. Even though English society is described as a child centered society, it is not a child friendly society. Children are often barred from what are seen as adult enclaves or domains. Almost a separate world is erected around the child. There are certain expectations of the child, eg. that he/she should fit into certain time schedules eg. feed and go to sleep at certain times. The child is not generally exposed to or treated as a part of the ongoing family activities to the same extent as the Lisu child. The rise of the nuclear family has made the mother the primary and sometimes only caretaker, but reliant on others if she works. Generally children are treated as communicative partners, though this varies widely. Children's utterances are generally imitated, speech is adapted to the child, children are taught language and corrected. Polite language is important in particular for addressing a person, requesting, and thanking someone. Children traditionally are expected to respect and listen to their elders. Children's physical needs are not catered for as much as in Thai or Lisu societies. If a child cries they are not always responded to.

There are various parallels between Kaluli and Lisu, and Samoan and Thai societies. Both Kaluli and Lisu societies are egalitarian, value the ability to speak well, carry the infant around everywhere, never leave the infant alone etc. However Kaluli mothers, unlike Lisu mothers describe babies as helpless and having no understanding, and they therefore do not treat infants as communicative partners. They face the infant outward and respond for the child. Thai and Samoan societies are both

stratified societies, tend not to guess, hypothesise, or interpret utterances made by the child. Infants are not treated as conversational partners. Although from an initial comparison Kaluli and Lisu, Samoan and Thai societies show similarities, these similarities are only surface realisations. Underneath this surface, the cultures are very different, and in order to look at the language socialisation of the child, each culture has to be studied in its own right and in detail.

Societies vary as to how much and to what extent they adapt the situation to the child, or the child to the situation. Although Lisu children are expected to meet the needs of the situation, Lisus appear to use parts of the baby register at least, in contrast to Ochs and Schieffelins' prediction. In order to examine this further and to see which parts of the baby register are used and with what frequency, a more detailed analysis would be required.

To answer the questions raised and to understand language socialisation processes in these different societies better, a much more detailed, in-depth analysis is needed than the questionnaire/informal observation methodology used here, ie. an audio-visual taped analysis of mother/caregiver-child interactions at different stages of development, needs to be carried out. These preliminary findings need to be checked and elaborated on. The problem of course is the time this type of analysis takes. A questionnaire format can only find out a limited amount of information. Different cultures vary a great deal as to how they socialise children and what values they perceive as important. These get transferred to the child

through the socialisation process. Children are socialised through language to adopt the appropriate behaviour and norms of the society. Furthermore the environment and lifestyle plays a large role in how much time is given to and in what manner the child is reared.

There is a wide variation in language socialisation practises in the different societies of the World. It is interesting that regardless of this extremely varied process, children still acquire the ability to speak their own particular language at similar developmental stages. It has been suggested that language specifics rather than language universals are facilitated by social interaction (Newport et al 1977, Berman et al 1981, de Lemos 1981, Aksu-Koc 1988).

CHAPTER 3 - METHODOLOGY

3.1 Language Selection

Thai was chosen as one of the languages of study, due to my familiarity with the language. Lisu was chosen because of its very different structural form/properties from English or Thai. It has verb final position and shows heavy reliance on clause final particles. It was thought that a comparison of the acquisition of the temporal systems of these three, structurally very different languages (Lisu, Thai and English) would be of interest.

3.2 Study Site

I spent a period of nine months, from April 1989 to December 1989, and a further period of 6 months from November 1990 to June 1991 collecting data on Thai and Lisu in the north of Thailand. The data for the four tasks was collected during the first period. The majority of Thai and Lisu data was collected in villages in the district of Mae Taeng in the province of Chiangmai, about 50km from the main northern town of Chiangmai. I had previously worked in Thailand for 3 years and was familiar with the region and Thai language.

Selection of the Study Site

I collected the majority of the Thai and Lisu data in the vicinity of the village of Pang mai taeng of Mer Taeng district in the North of Thailand. The reason I selected this site was because of advice and help I received from Ajaan Sanit and Ajaan Prasert at the Hilltribe Research Centre based at the University of Chiangmai. Ajaan Prasert very kindly introduced me into the village, where he often works and is well-known and respected.

While collecting the Thai and Lisu data I stayed with a Lisu family. This meant that I had to take the data regularly to the town for safe-keeping.

3.3 Subjects

AGES OF SUBJECTS IN THE FOUR TASKS

TASK 1 THE CONVERSATION TASK

	Group			
	1	2	3	4
Approx. Age Range	3;7 - 4;6	4;7 - 5;6	5;7 - 6;6	6;7 - 7;6
Number of Subjects	9	9	9	9
LISU				
Age Range	3;3 - 4;5	4;7 - 5;3	5;6 - 6;6	6;7 - 7;6
Mean Age	3;8	4;11	6;0	7;0
THAI				
Age Range	3;3 - 4;6	4;8 - 5;5	5;8 - 6;3	6;6 - 7;3
Mean Age	3;11	5;1	6;0	6;11
ENGLISH				
Age Range	3;8 - 4;6	4;6 - 5;3	5;6 - 6;6	6;8 - 7;6
Mean Age	4;1	4;11	6;1	7;0

In the Conversation task, there were nine children in each age group rather than ten due to missing data.

TASK 2 THE MARBLE GAME

	Group			
	1	2	3	4
Approx. Age Range	3;7 - 4;6	4;7 - 5;6	5;7 - 6;6	6;7 - 7;6
Number of Subjects	10	10	10	10
LISU				
Age Range	3;2 - 4;5	4;8 - 5;3	5;6 - 6;6	6;7 - 7;6
Mean Age	3;7	4;11	6;0	7;0
THAI				
Age Range	3;3 - 4;6	4;8 - 5;5	5;7 - 6;3	6;6 - 7;7
Mean Age	3;11	5;2	5;10	6;11
ENGLISH				
Age Range	3;8 - 4;6	4;6 - 5;3	5;6 - 6;6	6;8 - 7;7
Mean Age	4;2	4;10	6;2	7;0

TASK 3 THE TOY GAME

	Group			
	1	2	3	4
Approx. Age Range	3;7 - 4;6	4;7 - 5;6	5;7 - 6;6	6;7 - 7;6
Number of Subjects	10	10	10	10
LISU				
Age Range	3;2 - 4;5	4;9 - 5;3	5;6 - 6;6	6;8 - 7;8
Mean Age	3;7	4;11	6;0	7;2
THAI				
Age Range	3;3 - 4;6	4;8 - 5;5	5;8 - 6;3	6;6 - 7;4
Mean Age	3;11	5;2	5;11	6;11
ENGLISH				
Age Range	3;7 - 4;6	4;6 - 5;6	5;6 - 6;6	6;8 - 7;7
Mean Age	4;3	4;9	6;2	7;0

TASK 4 THE ELICITED IMITATION TASK

	Group			
	1	2	3	4
Approx. Age Range	3;7 - 4;6	4;7 - 5;6	5;7 - 6;6	6;7 - 7;6
Number of Subjects	10	10	10	10
LISU				
Age Range	3;2 - 4;5	4;9 - 5;3	5;6 - 6;6	6;8 - 7;8
Mean Age	3;7	4;11	6;0	7;2
THAI				
Age Range	3;3 - 4;6	4;8 - 5;5	5;8 - 6;3	6;6 - 7;4
Mean Age	3;11	5;2	5;11	6;11
ENGLISH				
Age Range	3;7 - 4;6	4;6 - 5;6	5;6 - 6;6	6;8 - 7;7
Mean Age	4;3	4;9	6;1	7;0

The majority of the Lisu children were from the village of Bahn Chang in the north of Thailand, 50 km from the main town of Chiangmai. The remainder of the children were located in the town of Chiangmai, either at a Hostel for Hilltribe children, run by the Morse family, which enable children from remote hilltribe villages to attend school, or with parents working in Chiangmai. The children were selected because of their age suitability, willingness to participate and availability of their birth certificate, so that their ages could be endorsed.

One Baht coins were offered as incentives (these were

generally valued more than toys, snacks or fruit} to the Lisu children. Numbers were made up for each age group by interviewing other children at the Hilltribe hostel. The same children were often used for the different tasks, but this sometimes was not possible due to various factors, ie absence of the child or unwillingness of the child to participate further.

The Thai children came from the village adjoining the Lisu village. They were mainly interviewed and tested at the local primary and nursery school of Pang mai Taeng school. Other children were found at a neighbouring school, and at their homes in the village. The children were selected because of suitability of their age and availability at the time of interview. Snacks or fruit were given as incentives. The same children were mainly used for all the tasks, but this depended on them not being absent from school.

A group of Thai and Lisu adults were also tested. They were selected mainly due to their willingness and lack of embarrassment in participating in the tasks.

The English children in the study came from either Gilesgate County Infant School in Durham (N.E. England) or from Alexandra Day Nursery in Reading, (S.E. England). The children were selected by age and willingness to participate. Often the same children were used for different tasks, but sometimes this was impossible due to absenteeism or unwillingness to participate further. English adults were also tested. They were parents of the children tested.

3.4 Assistants

For the collection of the Lisu and Thai data a native speaker assisted the researcher. The assistant was trained to carry out the experimental tasks while I checked the correctness of the test sentences, method, procedure and recorded the response of the child on to check sheets. Lisu is not a written language, so we had to translate the test sentences from Thai to Lisu and then record the sentences on to a portable cassette player, so that for each test session the Lisu assistant could play back the test sentences and say them correctly in the right order and not change them. This meant that once the sentences were randomised the order of presentation of the test sentences was the same for all children. If the sentences had been randomised for all children this would have required 40 different tapes for the Lisu children, which was not practical.

The Lisu assistant was a 17 year old woman from the Lisu village. She spoke fluent Thai. We communicated in Thai, although I could understand a limited amount of Lisu.

The Thai assistant was a 19 year old woman from the Thai village adjoining the Lisu village. I would read the test sentences out in Thai and she would repeat them to the child.

For the Conversation task I would read the question out in Thai to the assistant, who would either say it in Lisu or Northern Thai to the child.

The Conversation and Elicited Imitation responses of the child were taped and transcribed later with the help of the assistant. For the Marble and Toy tasks the responses were recorded during the task session onto check sheets. Later these

responses were collated.

3.5 Task Setting for each Language Group.

The setting for the experimental tasks varied within and between language groups, depending on the location of the child. In the Lisu village the test sessions would take place usually outside on the ground or sometimes on top of a bamboo platform inside the house. This depended on where the child was found and where he/she was willing to participate in the task. Often other children and adults were present. However I would ensure that the child was not assisted by others. Most of the Thai children were tested seated at a table outside the classroom. The English children were tested either inside or outside the classroom depending on convenience for the school or teacher.

3.6 The Tasks and Procedures

Initially a pilot study was carried out on two Japanese children with the assistance of their father. The aim of this was to try out different methodologies and procedures, the use of an assistant in the experimental procedures, and to see what collecting data in this manner entailed. However selection of the tasks and materials was not finalised until I was actually in the Lisu village and was able to observe the normal play activities and experiences of the Lisu children. I specifically designed the tasks with the Lisu children in mind, because their life style and experiences are least like that of English children and their experiences are less varied and diverse.

Four different tasks were used to investigate the acquisition of the temporal systems of the languages under study;

Task 1 - The Conversation Task, an interview about the daily life and the daily activities of the child.

Task 2 - The Marble Game, an acting out comprehension task with marbles.

Task 3 - The Toy Game, an acting out comprehension task with plastic, toy animals, a fence and a tree.

Task 4 - The Elicited Imitation Task. The child repeats the sentence given by the experimenter.

Generally, Task 1 was presented prior to Task 2, which was presented prior to Task 3, which was presented prior to Task 4. There were some exceptions to this due to loss of Subjects, and so replacement Subjects had to be found.

It was felt that using several different methodologies would give a broader view of the acquisition of the temporal semantic fields in the three languages of study. Tager-Flusberg et al (1982) advocate the use of diverse tasks whenever possible to reduce the problems and limitations inherent in assessing performance. According to these researchers, there are two major advantages in using several performance measures in child language research. The first is that when there is an overlap in the data from several experiments, this increases confidence in the results obtained. Secondly, different tasks will often produce complementary findings. The choice and number of tasks was limited due to several factors, namely the familiarity of the children with the type of task, ease and flexibility of presenting the task to the children in different settings, and time and manpower restrictions. All methods have their limitations and biases.

Task 1 The Conversation Task

This task was chosen because it was a relatively fast and easy way of eliciting information about the temporal systems I was interested in. It was also a way of finding out more about the daily lives of the different children and more about the actual everyday usage of 'temporal language' in the different cultures. It is much less time consuming than collecting and transcribing natural language, especially as the specific focus was on temporal language. It is limited because of the artificiality of the situation; being interviewed is certainly not a familiar or normal occurrence in Thai or Lisu society. It is a more familiar situation for English children. This type of interview methodology is restricted, in that it does not reflect the full language capacity of the child. It looks at only a limited sample of language and only a limited amount of information about temporal comprehension and production can be collected using this method.

Procedure

The child was told that we wanted to ask some simple questions about their daily life. Some warm-up questions were given and then each child was asked at least 16 questions. These questions varied slightly depending on the environment and background of the child. The questions were adapted to the daily life and life experiences of the individual child, but the format of the questions for all three language groups was basically the same. (See Appendix 3 for a list of the questions asked.) The interviews were taped and transcribed later, and for Lisu and Thai an assistant helped.

The questions consisted of at least 2 'before', 2 'after', 2 past or anterior (yesterday), 1 future or posterior (tomorrow), 4 present or simultaneous (today and now), and 1 experiential perfect question. Questions about anterior (past) activities were asked using "Yesterday" questions eg. "Yesterday what did you do?" Questions about posterior (future) activities were asked using a "Tomorrow" formatted question eg. "Tomorrow what will you do?" Simultaneous (Present) events were asked about, using either a "Today" question eg. "Today what is your father doing?" or a "Now" question eg. "What is the dog doing(now)?" Comprehension of 'before' and 'after' was also looked at, eg. "Before breakfast what do you do?" Questions to look at comprehension and response to the experiential perfect were also used, eg. "Have you ever been to Newcastle?" At least 16 questions were asked of each child (see Appendix 3).

Analysis

The language of the child was examined in various ways for comprehension and the responses to the questions asked. In particular, errors in comprehension and production were examined. Also the language produced was broken down into various component parts, in order to look at aspect used, language of posteriority, simultaneity and anteriority, means of connecting clauses, and locating events in time with an aim of comparing the different age and language groups. The different characteristics of the languages and the different daily lives of the children in the different cultures could also be looked at.

Task 2 The Marble Game

Marbles are familiar play things for children in all three cultures. The task is a simple task involving simple commands and a reduced memory load.

eg. "You throw your marble before I throw my marble".

The child only has to act out one of the clauses, and so this task was thought of as particularly suitable for the youngest children. It was found to be sometimes difficult to record the response of the child, especially for simultaneous 'when', 'while', 'together' trials. This unreliability was compensated for to some extent by having 6 trials for each connective and repeating the trial if the response was not clear to the recorder. 'since' could not be included and with 'until' a negative had to be used to make the command more natural eg. "Don't throw your marble until I throw my marble."

Test Sentences

The test sentences (see Appendix 4, 5 and 6) were first randomly ordered, then translated into each language. Check sheets were made to record the childrens' responses.

Each child was given 42 test sentences - 6 trials of each of the sentences with the 7 connectives; **'then', 'after', 'when', 'while', 'before', 'until'** and **'together'**.

The test sentences were of the following basic form:

"I(you) roll my marble (connective) you(I) roll your marble."

or "(connective)" I/you roll my marble You (I) roll your marble."

For "together", "You and I roll our marble together" and

for "until" sentences a negative was incorporated,

eg " You <u>don't</u> throw your marble <u>until</u> I throw my marble".

In Lisu there is no single word for "while", "while" is represented by "thae" - "when" and "kya", the progressive aspect marker.

<u>Procedure</u>

The following instructions were given:

"We are going to play a game with marbles. You must listen carefully and do what is said."

Then each child was given 3 practice trials of the following form:

"First you roll your marble, second I roll my marble"

"First I roll my marble, second you roll your marble"

"We both roll our marbles"

to give examples of all possible responses, ie in the sequence of rolling in both possible orders ie. S E and E S, and in simultaneous rolling E+S (E=experimenter, S=subject). The Subject was also taught to respond or expect the Experimenter's response after the count of three. This was to structure the responses of the Subject and Experimenter.

The task was split into two halves, the first half the children acted out the sentences using marbles, the second half they used toy cars. This was to try and maintain the interest of the child. If the child was willing we would do all 42 sentences in one session, otherwise the child would do the first half of the sentences one day and the second half another day.

Each test sentence was repeated twice to the child. If their attention faltered for some reason or another, the sentence was repeated again.

Task 3 The Toy Game

This is a more complex task than the Marble task, the child has to act out both clauses, so there is increased complexity of task and memory load. This task was chosen because recording the response was easier and more reliable than the Marble task. Also the connective 'since' could be included, and it was not necessary to use a negative with the connective 'until' in this task. It is a more unnatural task than the Marble task. The objects have to do the actions rather than the subject and experimenter in the Marble task. Also Lisu children are not used to playing with such toys or this type of task. However it was found that this task maintained the interest of some of the older children more than the Marble task. English children are more familiar with this type of activity than Lisu or Thai children.

It is a similar task to the task used by Clark, (1971) to investigate the acquisition of 'before' and 'after', except that in the Clark sentences only one subject or actor is used, whereas in this task in some trials two actors are used and in some trials one actor is used.

A Clark sentence eg. "The boy patted the dog before he jumped the gate".

The Toy task eg. "The dog jumps over the fence before the pig runs around the tree." **and** "The dog jumps over the fence before he runs around the tree".

Also in the Clark sentences the past tense is used. As Stevenson and Pollitt (1987), pointed out the use of the past tense for the English sentence makes the task 'unnatural', which adds to

the task difficulty. In English, because the past tense has been used in the Clark sentences, the reference time is earlier than the speech time. If 'before' or 'after' or 'since' and 'until' are used then it puts the event time earlier or later than the reference time. In the Toy task the present tense is used for the English sentences. The Toy task requires the child to remember two events and order them correctly, and then subsequently act them out.

Stevenson and Pollitt (1987), found that performance with their simplified command sentence:

eg. 'Move the blue car before the train stops'

was superior to performance with sentences like those of Clark (1971). They found that only when memory load was reduced so that just one of the 2 events has to be acted out are there clear gains in correct response. It was thought that it would be interesting to compare the childrens' responses to the two different comprehension tasks, namely Task 1 and Task 2.

<u>Test Sentences</u>

The test sentences (see Appendix 7, 8 and 9) were first randomly ordered, then translated into the appropriate language. Check sheets were made to record the chid's response.

Each child was given 48 sentences, with 6 trials of each of the 8 connective; **'then'**, **'after'**, **'when'**, **'while'**, **'before'**, **'until'**, **'together'** and **'since'**. In Lisu there is not a separate form for "while", it is represented in this task by "thae" - "when" and "kya", the progressive aspect marker. The children were required to act out two clause sentences with 1 or 2 actions and 1 or 2 actors. There were 4 possible actions

with 3 possible actors (a pig, dog and a hen) of the following form:

The four possible actions were:

"jump over the fence"

"run around the tree"

"sleeps" or "bumps"

The three possible actors were:

"a pig", "a dog", "a hen".

One or two actors or subjects were required for each action. The actions were chosen because they were easy to see and record. These actions and actors were combined with each connective.

The different sentence forms were;

<u>two subjects, two actions</u>

e.g. "The hen runs around the tree (connective) the dog jumps over the fence" or

"(connective) the hen runs round the tree the dog jumps over the fence".

<u>two subjects, one action</u>

eg. "The dog and the pig run round the tree together".

<u>One subject, two actions</u>

e.g. "The hen runs round the tree (connective) jumps over the fence."

or "(connective) the hen runs round the tree, jumps over the fence".

<u>Procedure</u>

First it was checked that the child could name the materials correctly and was familiar with the names of the objects used in the test sentence. Then the child was given practice at all the actions in the test sentences. If the

child could do this satisfactorily, then the test sentences were presented.

The following instructions were given:

"We are going to play a game with toy animals. You must listen carefully and do what is said"

If the child was willing all test sentences were given in one session. Otherwise they were broken up into separate sessions.

Each test sentence was repeated twice. However if the child was distracted the sentences were said more than twice, especially with the youngest age group of children. The responses of the children were recorded onto check sheets.

Task 4 Elicited Imitation

In elicited imitation, a child is asked to repeat a model sentence immediately after it has been produced by an experimenter. It is thought that when a sentence is too long or complex to reproduce by rote, the child makes systematic errors repeating the model sentence (Slobin 1967). Slobin and Welsh (1973) termed these errors assimilatory deformations, since they argue that the child assimilates the stimulus material, recoding and reiterating it to be congruent with what he knows about his language. Substitutions may suggest which terms a child has available within a semantic field. Considering the terms which actually appear in the imitations of children at different ages should provide a clearer picture of the order in which terms enter a semantic domain (Keller-Cohen 1981). Bloom et al (1975) found that one factor that constrains utterance length is the presence of a newly

learned lexical item. So if a child must repeat a sentence with a lexical item he has not fully analysed, he ought to produce a more degraded imitation than sentences with lexical items he has analysed more fully. However this type of method has been criticised for the following reasons: Bloom et al (1975) points out that because the usual procedure in this type of task is to present sentences in the absence of context, the data obtained could seriously underestimate what a child is capable of producing in a context in which the sentences might be plausible. Also children may 'parrot' sentences within their immediate memory span and hence appear to process sentences they could not themselves produce (Hood and Lightbown 1977).

This method has been used cross-linguistically as cited by Slobin (1967). It is a fairly simple task to carry out in the field. It was also interesting to compare the responses of the children from the different languages to look at the different strategies used.

It is to be borne in mind that English children are more familiar with this type of task than Lisu children. Thai children also have experience of this type of activity, as oral drills are favored in the Thai educational system. In this task the sentences were designed so that all three cultures, in particular Lisu are familiar with the activities performed by "the girl" or "the boy" in the test sentences. The ability to be able to store two clauses is a problem in particular for the youngest age group children.

eg. "The boy fetches the water before the girl sweeps the

floor".

The methodology used is similar to that used by Keller-Cohen (1981). However the present tense is used in the English test sentences used in this study. The influence of progressive aspect on the childs' acquisition of temporal reference in the three different languages was also investigated. In conjunction with a temporal connective, the English progressive is often used to signal simultaneity between 2 events, whereas the past may be used to indicate completion (Keller-Cohen 1981). This was investigated here in Thai and Lisu as well as English for the connectives, 'then', 'after', 'when', 'before' and 'together'.

Research evidence suggests that children less than 5 years of age have not acquired a completive-continuation contrast between the past and the progressive verb forms (Feagans 1980). Feagans predicted that aspect would not affect a child's interpretation of temporal connectives until nearly 5 years of age. At this age the acquisition of the progressive might aid a child in interpreting sentences describing simultaneity, since he/she would have begun to be sensitive to both the verb form and the temporal connective (Keller-Cohen 1981). This interaction was also investigated in Lisu and Thai.

Test Sentences

The test sentences (see Appendix 10, 11 and 12) were randomly ordered and then translated into Thai or Lisu. Check sheets were made for transcribing the responses from the tapes.

Each child was given 48 or 52 sentences (48 sentences for Lisu, 52 which included the connective 'while' for Thai and English). The trial session consisted of the 7 connectives '**then**', '**after**', '**when**', '**before**', '**until**', '**together/at the same time**' and '**since**'. There were 4 trials for each connective, ie in total 28 test sentences. The 5 connectives '**then**', '**after**', '**when**', '**before**', and '**at the same time/together**' were also combined with progressive aspect markers. There were 4 trials for each of these sentences, in total 20 sentences. The total number of sentences presented to the Lisu children was 48. An additional 4 sentences with '**while**' were included for the Thai and English children. This was not included in the test session for the Lisu children, because there is no single word meaning '**while**' in Lisu.

The test sentences consisted of 2 clauses joined by a connective. Each clause consisted of an actor and an action. Two actors 'a boy' and 'a girl' with 7 different actions;

'sings a song'

'sweeps the floor'

'washes the plates'

'washes the clothes'

'sews the material'

'chops the wood'

'eats the snack/fruit'

The possible influence of aspect on the child's acquisition of temporal reference was also explored. Each connective (except 'since', 'until' and 'while') had a

separate condition with and without progressive aspect marking.

eg. in English "The girl sews the material (Conn) the boy sweeps the floor" - without progressive aspect marking, and "The girl is sewing the material (conn) the boy is sweeping the floor" - with progressive aspect marking.

In English the present tense and the present progressive were used. In English the connective 'since' requires a more complex tense-aspect form. The form used here was the past tense for the first clause and the past perfect progressive for the second clause, eg.

"Since the boy brought the water, the girl has been sewing the material."

However when evaluating the data sheets in "since" sentences errors in tense were not included in the scoring system, to make the score comparable with Thai or Lisu which do not encode tense.

Procedure

It was explained to the child that he or she was to repeat the sentences spoken by the experimenter, and that each sentence would be repeated twice. The child was given practice sentences until he or she understood and could do the task. For Lisu, as the language is not a written language, the test sentences were recorded onto a small, portable cassette player, so that the assistant could listen to each trial sentence and then say it to the child in a standardised form. Each sentence was said twice to the child, except in circumstances where the child's attention wandered.

For Thai the assistant read the test sentence to the child. For English I read the test sentences to the child. The sentences were spoken at a normal rate and speed. The child's responses were recorded onto a portable tape recorder, which were later transcribed recorded onto the prepared check sheets.

CHAPTER 4 - RESULTS

4.1 CONVERSATION TASK

ANALYSIS OF THE CHILDRENS' LANGUAGE

The childrens' language was grouped into various categories as follows.

4.1.1 Errors

Errors were looked at in order to gain clues about the different stages in language acquisition. However an important point is that the language elicited from the children is relatively error free.

Errors in Comprehension

Comprehension of Before/After

In Age group 1 (3;7-4;6), there are some errors in the interpretation or comprehension of 'before' and 'after' in all languages. There are two types of errors; **Type 1 error** 'before' or 'after questions' are interpreted as referring to the Reference time, instead of the actual Event time eg. in the question "Before breakfast what do you do?" the reply is "I have toast", the time of reference is taken to be "at Breakfast time". In other words the question is responded to as if it were the following question: "At breakfast what do you do?" The Event time (ET) is interpreted as being the Reference time (RT). This type of error indicates that the child has not yet acquired the ability to make reference to a separate ET and RT.

Type 2 error the interpretation of 'before' and 'after' is confused eg. "After breakfast what do you do?"

Reply: "I get up"

These Type 2 errors were difficult to detect, especially in Thai

or Lisu where the 'before' answers are often the same as the 'after'answers

eg."Lahng meu"

wash hands

which is an appropriate answer for either of the following questions:

"Before breakfast what do you do?" or "After breakfast what do you do?"

or similarly for Lisu a common response was:

'ganya'

play.

Table 7 - Type 1 Errors

	English		Thai		Lisu	
	before	after	before	after	before	after
Age group 1	4	1	1	2	0	2
Age group 2	2	0	0	0	0	1
Age group 3	0	1	0	0	0	0
Age group 4	0	0	0	0	0	0
Adults	0	0	0	0	0	0
Total	6	2	1	2	0	3

Table 8 - Type 2 Errors

	English		Thai		Lisu	
	before	after	before	after	before	after
Age group 1	2	0	0	0	0	1
Age group 2	2	0	0	1	0	2
Age group 3	0	0	0	0	0	0
Age group 4	0	0	0	0	0	0
Adults	0	0	0	0	0	0
Total	4	0	0	1	0	3

As can be seen from Tables 7 and 8, there are relatively few 'before/after' errors recorded. There are more Type 1 than Type 2 errors recorded. For Age group 1 (3;7-4;6), there are more

Type 1 errors - 8 errors, than Type 2 errors - 3, ie. in the ratio of 8:3, but for Age group 2 (4;7-5;6) there are less Type 1 errors than Type 2 errors, in the ratio of 3:6.

Comprehension of Yesterday/Tomorrow

Some errors in the comprehension of 'Yesterday' and 'Tomorrow' were detected. Some children were found to confuse these two concepts. In Age group 1 (3;7-4;6), there was one error for English, one error for Lisu, and no errors for Thai detected. In Age group 2 (4;7-5;6) only one error was found for English. Again errors were difficult to detect especially in Lisu or Thai, where day to day activities are often the same. In one case in English Age group 1 (3;7-4;6), 'tomorrow' was responded to as if it meant "in the future at sometime". The question asked was "What will you do tomorrow ?" and the reply was: "Go in a caravan for a holiday", whereas in fact the child was not going on holiday until sometime later.

4.1.2 Length of Response

This was an approximate estimation of the length of reply, to compare the length of responses of the different language groups to the questions used. It is an attempt to give a more objective rather than subjective evaluation of the length of reply of the children in the different language groups. In order to try to standardise this estimate the responses of the child in English or Lisu were translated into Thai, and then the number of words were counted. This meant that for English a lot of prepositions, determiners, tense auxiliaries and other additional morphemes/words were not counted, eg for English "Brush my teeth" when translated into Thai has 2 words only ie.

"praeng fan" "brush teeth", or "Go to bed" has 3 words, but only 2 words in Thai "pai non" "go sleep".

Table 9 - Length of Response

	English		Thai		Lisu	
	no. words	mean no.	no. words	mean no.	no. words	mean no.
Age group 1	442	49	287	32	304	34
Age group 2	487	54	281	31	301	33
Age group 3	505	56	275	30	369	41
Age group 4	569	63	278	30	310	34
Adults	453	50	371	41	304	34

However English children used more 'subjects' in their responses, due to the character of the language, than Thai or Lisu, so it is not a very reliable measure. However as can be seen in Table 9 overall, English children in all age groups replied in a lengthier manner than Thai or Lisu children, and Lisu children generally responded in a lengthier manner than Thai children. This is probably due to familiarity with this type of task routine, and to cultural factors, see Language Socialisation chapter 2.

Table 10 - Number of 2-clause and 3-clause responses

	English		Thai		Lisu	
	2-clause	3-clause	2-clause	3-clause	2-clause	3-clause
Age group 1	9	0	6	1	1	0
Age group 2	18	0	13	1	14	0
Age group 3	15	1	0	0	41	12
Age group 4	23	0	3	0	12	0
Adults	6	0	1	0	1	0

The English children also used more clauses in their replies than Thai or Lisu children, as can be seen from Table 10. Age group 1 (3;7-4;6) used the least number of clauses in all three languages. Age group 2 (4;7-5;6) used more clauses than Age

group 1 (3;7-4;6) for all languages. For English children the number of clauses used increased with age, with Age group 4 (6;7-7;6) using the most number of clauses.

4.1.3 Temporal Connectives

English children used more temporal connectives than Thai or Lisu children. In these languages the connective often does not have to be specified, but is inferred or other devices are used eg. double verbs or the meaning is understood from the context without being grammatically expressed.

In Age group 1 (3;7-4;6) and all other age groups all languages used addition and sequence to join clauses. In English Age group 1 (3;7-4;6) 'when' was used as an adverbial phrase by one child ie.

'What do you like to do the most?"

"When I write them numbers?"

'After' was used as an adverbial by one child and as a conjunction by three children in Age group 1 (3;7-4;6), two of the children also used 'after' to reverse the order of mention of events, eg.

'I play after I waken up'

'Before' was used by one child as a conjunction to reverse the order of mention of events. One child used 'while' as a connective, ie."I stay upstairs while Mum and Dad get dressed".

In Age group 2 (4;7-5;6) 'when' is used as a connective by one child. In Age group 3 (5;7-6;6) 'after' and "till" are used as a connective. In Age group 4 (6;7-7;6) 'after' and 'before' are used as connectives.

4.1.4 Temporal Adverbial Phrases

Adverbial phrases were used frequently by English children, but were not used often by Lisu children, and not at all by Thai children in their replies in this task. In Age group 1 (3;7-4;6) only English children used adverbial phrases. In Age group 2 (4;7-5;6), some Lisu children used deictic adverbial phrases, ie. "yesterday", "tomorrow", "today" and "next day", and in Age groups 3 (5;7-6;6) and 4 (6;7-7;6) "everyday" was also used. The replies by Thai and Lisu children were kept short and economical. In Age group 4 (6;7-7;6), English children used a rich variety of adverbial phrases. English children used a wide range of temporal adverbials, Lisu children used only a few, and Thai children none. This is probably due to the character of the languages. Thai and Lisu are more economical languages than English and are more "discourse" type languages. The task presented to the children is also alien, in particular to the Lisu children. Also the Thai children were interviewed in a school setting, which probably constrained and shaped their behaviour.

English children used specific temporal reference eg. "last Sunday". English children are more regulated by the calendar and time and days of the week than either Thai or in particular Lisu. The Lisu also have a different week; a 12 day week with each day named after an animal. The day of the week can determine the propitiousness of carrying out certain activities eg. buying a pig. The Temporal Adverbial phrases used by the English children are further categorised in terms of adverbial types (see Tables 10-13) using Bennett and Partees' and

Carlotta Smith's classification systems for temporal adverbials.

Bennett & Partee classified temporal adverbials as follows:

A. **Frame Adverbials** eg. this morning, 3 days ago, yesterday.

B. **Adverbial phrase of number and frequency** is equivalent to the habitual and iterative aspect of an event eg. always, sometimes, normally.

C. **Durative aspect** eg. for 3 days, all day, until tomorrow, since yesterday.

Carlotta Smith's Deictic/non-Deictic taxonomy is as follows:

1. **Deictic Adverbs** anchored to ST eg. yesterday, tomorrow. This category is equivalent to Bennett and Partees' category A.

2. **Semi-deictic Clock-Calendar Adverbs** may/may not be anchored to ST, eg. on Tuesday, at noon.

3. **Non-deictic Dependent Adverbs** not anchored to ST eg. previously, afterwards.

These two classification schemes for temporal adverbials were used to group the temporal adverbials used by the English children in this task. See Tables 11-14 for the classification of Temporal Adverbials for English children using this schema.

Classification of the Temporal Adverbial Phrases used by English children

THE NUMBER OF TIMES TEMPORAL ADVERBIALS WERE USED IN THE DIFFERENT AGE GROUPS OF THIS STUDY.

Table 11 - Age group 1 (3;7-4;6) English children

Six children used temporal adverbial phrases, 3 children did not.

	Deictic/Non-deictic			Aspectual	
	Semi/Deictic/Non-Deictic			No.& Freq	Durative
For a long time			1		1
sometimes			1	1	
after breakfast			2		
yesterday		2			
a long time ago			1		1
after playtime			1		
on Saturday	1				
normally			1	1	
last Sunday		1			
afterwards			1		
again			1	1	
just before			1		
just		1			
Total	1	4	10	3	2

Table 12 - Age group 2 (4;7-5;6) English

4 children used temporal adverbial phrases, 6 children did not.

	Semi/Deictic/Non-Deictic			No.& Freq	Durative
first			1	1	
after that day			1		
everyday			1	1	
first time			1	1	
a lot			1	1	
sometimes			4	4	
again			1	1	
today		1			
in the night	1				1
Total	1	1	10	9	1

Table 13 - Age group 3 (5;7-6;6) English

8 children used temporal adverbial phrases, 2 did not

	Deictic/Non-Deictic Semi/Deictic/Non-deictic			Aspectual No.& Freq	Aspectual Durative
till Friday	1				1
at night time	1			1	
at that time(every)	1			1	
on Saturdays	1			1	
sometimes			7	7	
always			1	1	
still			1		1
now		1			
normally			1	1	
all the time			1		1
Total	4	1	11	12	3

Table 14 - Age group 4 (6;7-7;6) English

6 children used temporal adverbial phrases, 4 did not

	Deictic/Non-Deictic Semi/Deictic/Non-deictic			Aspectual No.& Freq	Aspectual Durative
on Mondays	1			1	
every day			1	1	
some days			2	2	
this afternoon		1			
tomorrow		1			
sometimes			7	7	
normally			4	4	
during			1		1
for a little bit			1		1
still			2		2
at dinnertime	2			2	
in the evening	1				1
again			1	1	
just					
before breakfast			1		
after school			1		
a lot					
yesterday		1			
today		1			
early	1				
in the morning	1				1
Total	6	4	21	18	6

Summary of Results

'sometimes' seems to be the most popular temporal adverbial phrase used by the English children especially by the older children, it is a non-deictic adverbial indicating habitual aspect. The most varied, rich and diverse usage occurs in Age group 4 (6;7-7;6). Age group 1 (3;7-4;6) children used a diverse range of temporal adverbials. Amongst these were Semi-Deictic and Deictic Adverbials, Non-Deictic, Durative and Number and Frequency Adverbials. From Tables 11 to 14, we can see that the use of non-deictic adverbials increases with age. In particular the use of Number and frequency adverbials, but also Durative adverbials increases with age.

Lisu children, Age group 2 (4;7-5;6) used Deictic Adverbials in their responses, eg. 'yesterday', 'tomorrow', 'today', 'next day'. Lisu Age groups 3 and 4 used 'everyday', an adverbial of number and frequency. Thai children did not use any temporal adverbials in their replies. Because children did not use temporal adverbials in their responses to this task, does not mean that they are not capable of using them. The lack of temporal adverbials in the Thai children's responses partially illustrates the differences in the nature of the languages under study; Lisu and Thai are more Discourse languages than English is (see Table 1).

4.1.5 ASPECT

Aspect form (Viewpoint Aspect)

From Table 15 we can see that English, Age group 1 (3:7-4;6) and 2 (4;7-5;6) children, used progressive aspect marking most in response to 'simultaneity' questions, both "today" and

"now" type questions, eg. "**Today** what is your father doing?" and "What is he doing **(now)**?" The progressive is not used in response to 'posteriority' questions and only once used with an 'anteriority' question. In Age groups 3 (5;7-6;6) and 4 (6;7-7;6), the progressive is used for posteriority question responses, ie. the past continuous tense is used.

Table 15
Combination of Progressive Aspect Marking with "Tense"

		English	Thai	Lisu
Age group 1 (3;7-4;6)	**Posteriority**	1	0	13
	Simultaneity (Today/Now)	10/14	0	9/15
	Anteriority	0	0	2
Age group 2 (4;7-5;6)	**Posteriority**	0	0	10
	Simultaneity (Today/Now)	7/11	0	13/8
	Anteriority	0	0	5
Age group 3 (5;7-6;6)	**Posteriority**	3	0	12
	Simultaneity (Today/Now)	6/8	0	3/27
	Anteriority	0	0	3
Age group 4 (6;7-7;6)	**Posteriority**	4	0	2
	Simultaneity (Today/Now)	8/8	0	6/15
	Anteriority	0	0	11
Adults	**Posteriority**	2	0	1
	Simultaneity (Today/Now)	6/10	0	4/10
	Anteriority	0	0	1

In Lisu progressive aspect markers, (PAM) are used for posteriority, simultaneity and anteriority questions in all age groups. The most number of uses of PAM were with simultaneity questions. Thai children did not use the progressive at all in their responses to the questions.

Completed/ Change of State Aspect Markers

Thai, Age group 1 (3;7-4;6) used 'laew' to indicate completed action, and Lisu, Age group 1 (3;7-4;6) used the completed aspect marker 'woe'.

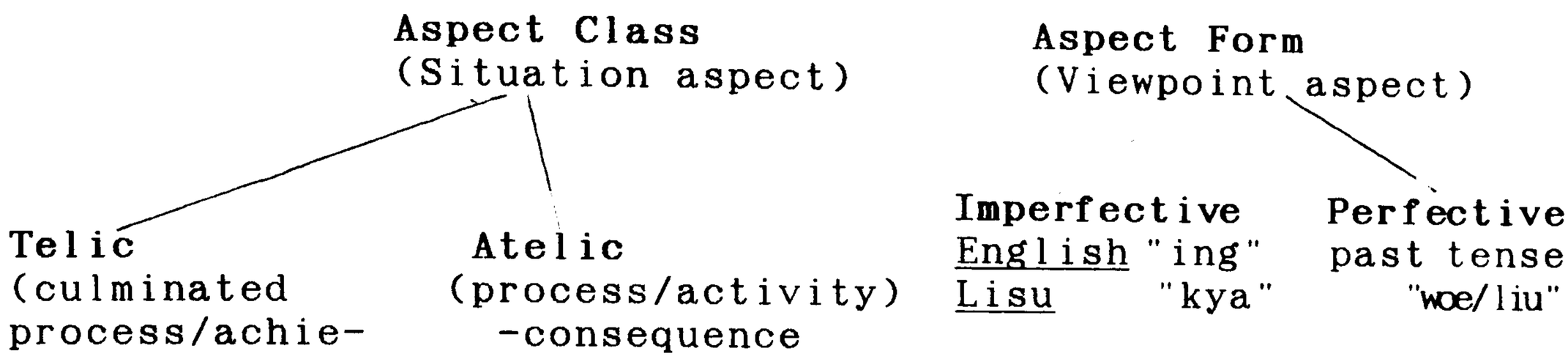
Experiential Perfect Aspect Markers

Thai and Lisu Age group 1 (3;7-4;6) children, used the appropriate experiential perfect particles 'keuy' and 'cua' respectively. English Age group 1 (3;7-4;6) children responded appropriately to this question type and in Age group 2 (4;7-5;6), the experiential perfect form was used.

The Combination of Aspect Form (Viewpoint Aspect) with Aspect Class (Situation Aspect).

How progressive aspect combines with situation aspect was examined in Lisu and English. Thai was not investigated as the children did not use progressive aspect markers in their responses. How the completed action aspect marker, 'woe' combined with situation aspect was also examined in Lisu. Thai again was not examined as usage of the completed aspect marker 'laew' was low. For English, use of the past tense, (it has a dual function which signals not only tense but also completed aspect), with situation aspect was recorded. A telic/atelic dichotomy was used to classify the verb phrases uttered by the children, see Diagram 8.

Diagram 8 The telic/atelic dichotomy used to classify verb phrases in this task



A telic event has an end point or consequence, whereas an atelic event does not have an end point or consequence. The overall results are shown on the following pages.

Table 16 - Combination of Progressive aspect with Aspect class for English,
(Atelic/telic dichotomy is used).

(Percentage scores are given and number of subjects using this combination of aspect are given in brackets, the total number of subjects in each age group is 9).

Agegroup	Telic	Atelic
1 (3;7-4;6)	26% (4)	74% (8)
2 (4;7-5;6)	29% (4)	71% (6)
3 (5;7-6;6)	54% (4)	46% (6)
4 (6;7-7;6)	21% (6)	79% (all children)
Adults	24% (6)	76% (all children)

Table 17 - Combination of Progressive aspect and Aspect class for Lisu

Age group	Telic	Atelic
1 (3;7-4;6)	6% (1)	94% (all children)
2 (4;7-5;6)	9% (5)	91% (all children)
3 (5;7-6;6)	10% (3)	90% (all children)
4 (6;7-7;6)	0%	100% (all children)
Adults	9% (1)	91% (7)

(Numbers in brackets are the number of subjects using this combination of aspect.)

Table 18 - Combination of Past tense with Aspect class for English

(Percentage scores are given).

Age group	Telic	Atelic
1 (3;7-4;6)	60% (6)	40% (6)
2 (4;7-5;6)	75% (8)	25% (4)
3 (5;7-6;6)	67% (8)	33% (4)
4 (6;7-7;6)	67% (8)	33% (4)
Adults	63% (7)	37% (5)

Table 19 - Combination of the Completed aspect marker, 'woe' with Aspect class for Lisu

(The number of uses of 'woe' is given, the numbers in brackets indicate the number of subjects using this particle.)

Age group	Telic	Atelic
1 (3;7-4;6)	3 (3)	3 (2)
2 (4;7-5;6)	4 (3)	1 (1)
3 (5;7-6;6)	2 (2)	3 (3)
4 (6;7-7;6)	2 (2)	0
Adults	1 (1)	0

From Table 16, it can be seen that English, Age group 1 (3;7-4;6) children used **progressive aspect** with both telic (26%) and atelic (74%) verbal expressions in this task and, in a similar proportion to the other age groups. Lisu, Age group 1 (3;7-4;6) children also used progressive aspect with telic and atelic verbal expressions, in similar proportions to the other age groups (Table 18).

English, Age group 1 (3;7-4;6) children used **past tense** with both telic (60%) and atelic (40%) verbal expressions (Table 17). Lisu, Age group 1 (3;7-4;6) children used the **completed aspect marker 'woe'** with telic and atelic verbal arguments. The usage of this particle in this task was low, and so actual numbers and not percentages are given (Table 19).

4.1.6 Future reference, modals and hypotheticals

Speakers of English refer to future events through a variety of different verb forms such as "will sing", "may sing", "wants to sing", "is going to sing". All of these forms, which express differing degrees of certainty may be used. Modal auxiliaries used for future reference in English express both mood and future tense (Lyons 1969). In Thai and Lisu, a temporal adverbial, eg. "tomorrow" can be used with or without a modal expression to indicate the future.

Harner (1981) classified future verb forms into four categories as follows:

(a) **conditional**, which includes 'could', 'can', 'may', 'might'.

(b) **necessity**, which includes 'has to', and ''s gotta'.

(c) **intentional** which includes 'will' and 'wants to'.

(d) **progressive** which includes "is going to" and "is gonna".

In English Age group 1 (3;7-4;6), 'got to ' (necessity), 'going to' (progressive) and the hypothetical 'think' are each used by one child to refer to future actions, otherwise the present tense was used. In Age group 2 (4;7-5;6), for English and Thai "will" (intentional) was used. Also for English Age group 2 (4;7-5;6), 'had to (necessity) was used. For English Age group 3 (5;7-6;6), 'might have/be '(conditional), and Age group 4 (6;7-7;6) 'had to', (necessity), were used. For English the most common term used for the future was 'going to' (progressive). Lisu children did not use modals in their replies.

4.1.7 Tense

In English Age group 1 (3;7-4;6) the present, present progressive, past and one example of the perfect progressive was used ie

"After I've been playing I come to this school".

In Age group 2 (4;7-5;6) the experiential perfect and the present perfect was used. Age groups 3 and 4 also used the past progressive.

4.2 MARBLE TASK

4.2.1 Scoring

A score of '1' or '0' was given for each trial depending on if the response was correct or not. Each child was given 6 trials for each connective. The total score for each child's response to each connective was scored out of 6. In each age group there were 10 children.

4.2.2 Overall Analysis

A Multifactorial Analysis of Variance on SPSSX was used to examine the effects of Age and Language on performance, both overall and for each connective. The Pillais multivariate Approximate F statistic was chosen, because it has been shown to be most robust multivariate test against nonnormality and heterogeneity of covariance matrices (Olson 1976).

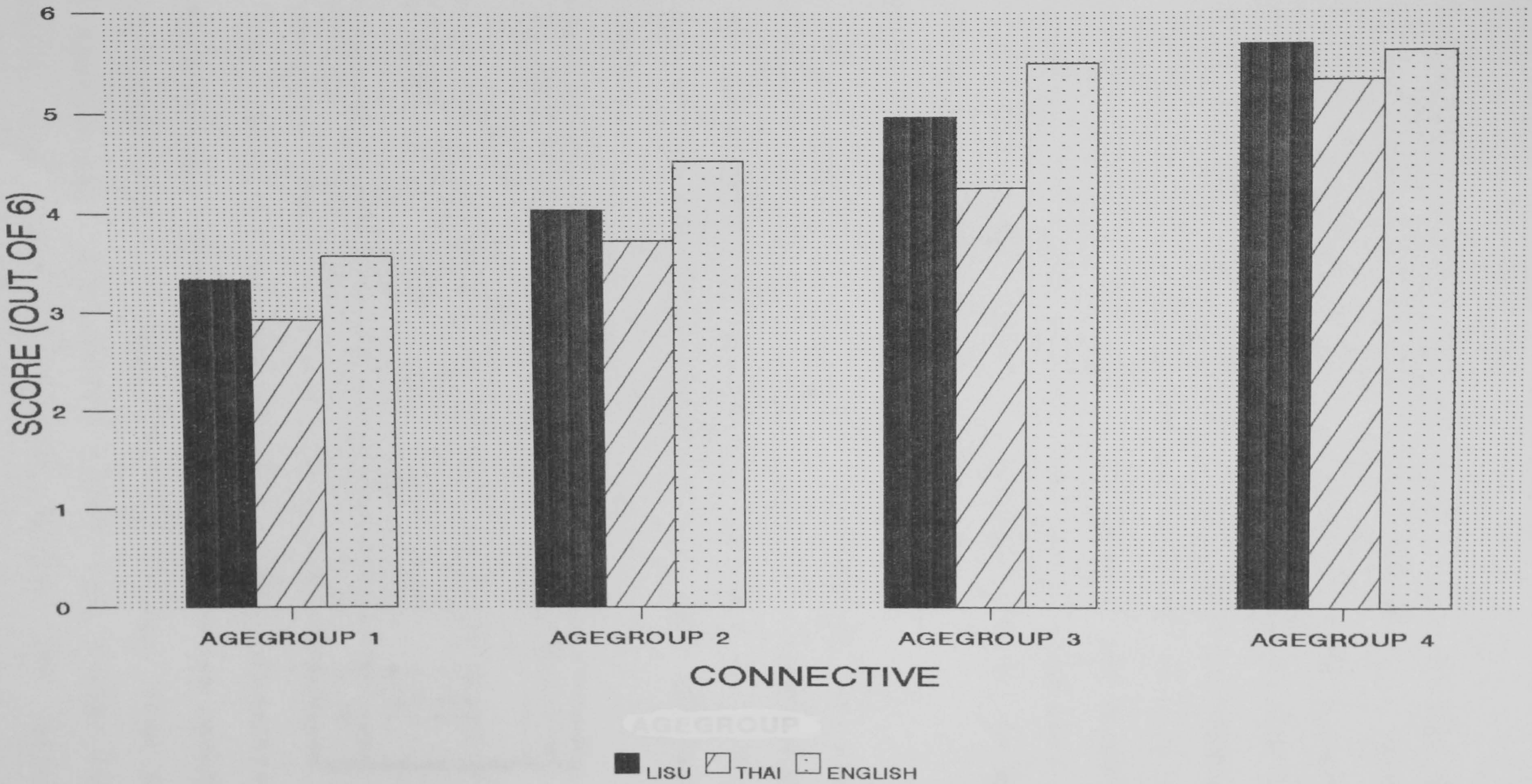
TABLE 19 shows the overall means for each age group in the three different languages (see Graph 1).

TABLE 19 Means for each age group and language.

	LISU	THAI	ENGLISH	MEANS
AGEGROUP 1 (3;7-4;6)	3.34	2.94	3.59	3.29
AGEGROUP 2 (4;7-5;6)	4.06	3.74	4.54	4.11
AGEGROUP 3 (5;7-6;6)	4.97	4.26	5.50	4.91
AGEGROUP 4 (6;7-7;6)	5.69	5.33	5.61	5.54
MEANS	4.52	4.07	4.81	4.46

The analysis revealed a main effect of Language (Pillais: Approx. F=10.92, Hypoth d.f. 14 $p<0.001$), a main effect of Agegroup (Pillais: Approx. F=6.63, Hypoth. d.f.=21, $p<0.001$), and a significant interaction between Language and Agegroup (Pillais: Approx. F=1.99, Hypoth d.f.=42, $p<0.001$). These effects are shown in Table 19 and Graph 1.

GRAPH 1 MARBLE TASK
LANGUAGE BY AGEGROUP



The main effect of Language was because performance was significantly lower for Thai than English (F=4.98, d.f. 2,117 p< 0.01 Newman-Keuls oneway analysis of variance - see Appendix 13) and Lisu was not significantly different from either English or Thai. The main effect of Age group was because performance increases with age in all language groups (F=58.57, d.f. 3.116 p<0.01 Newman-Keuls oneway analysis of variance - see Appendix 13). Inspection of Table 19 reveals that the interaction is because not all age groups show the Language effect. In Age group 4 the Language effect is not so apparent.

4.2.3 Analysis of Connectives

There was a significant effect of Language for all connectives except "while". For "while" there was no significant difference for language. This can be seen in Table 20, which gives the mean scores for each connective and each language, (also see Graph 2).

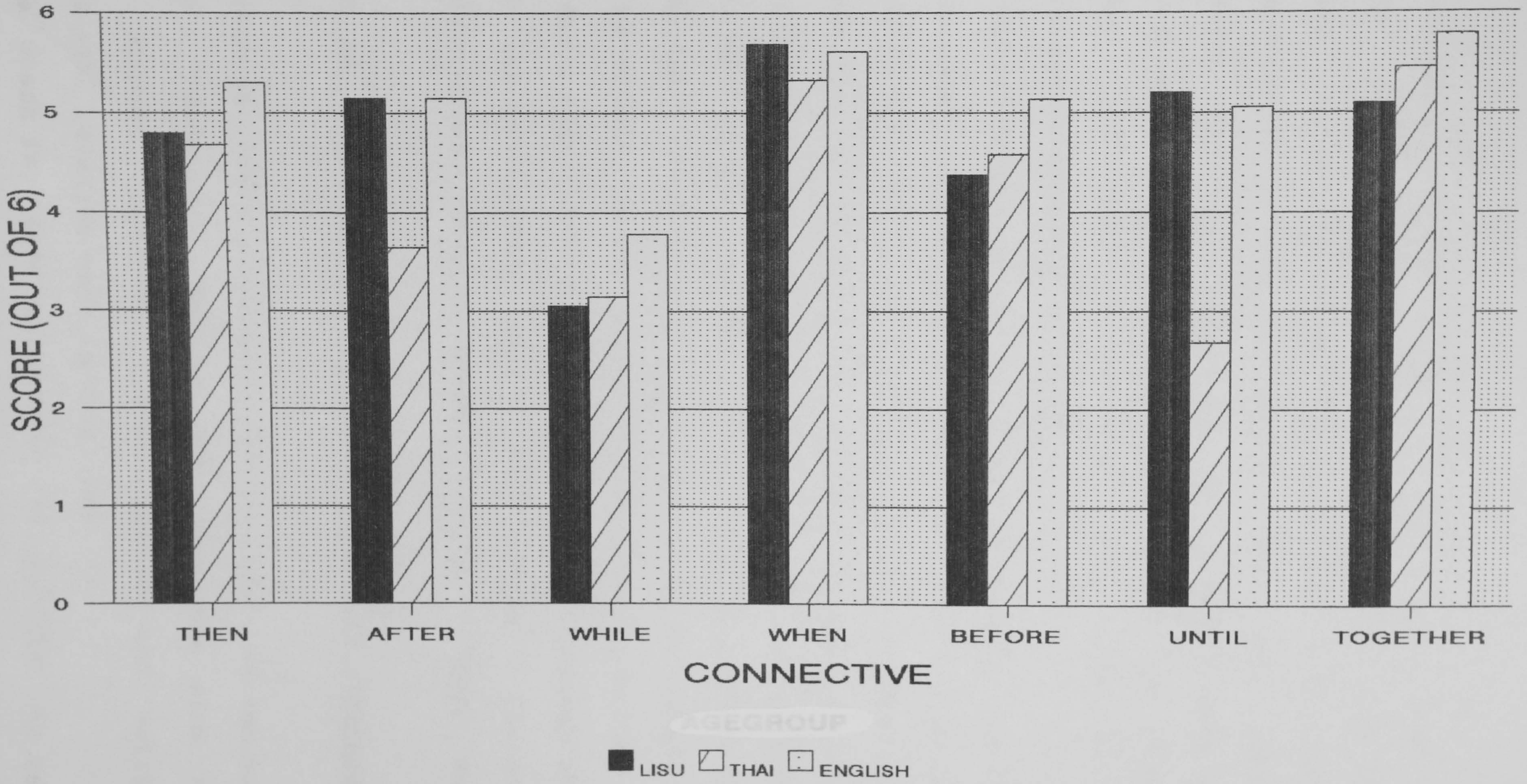
TABLE 20 The mean scores for each language and connective

	(Score out of 6)							
	THEN	AFTER	WHILE	WHEN	BEFORE	UNTIL	TOGETHER	MEANS
LISU	4.80	5.15	3.05	3.93	4.38	5.20	5.10	4.52
THAI	4.68	3.65	3.15	4.33	4.58	2.68	5.45	4.07
ENGL.	5.30	5.15	3.78	3.50	5.13	5.05	5.78	4.81
MEANS	4.93	4.65	3.33	3.92	4.69	4.31	5.43	4.47

To examine the effect of Language on individual connectives further, a Newman-Keuls oneway analysis of variance was carried out for each connective (see Appendix 17). It was found for "then" that English was significantly higher than either Lisu or Thai (F=3.72, d.f. 2,117 p<0.05 Newman-Keuls). For "after" and "until", Thai was significantly lower than either Lisu or

GRAPH 2 MARBLE TASK

LANGUAGE BY CONNECTIVE



English (F=13.54, d.f. 2,117 p<0.01, F=31.61, d.f. 2,117 p<0.01 respectively, Newman-Keuls). For "together", it was found that Lisu is significantly lower than English (F=5.21, d.f. 2,117 p<0.01 Newman-Keuls). We can also see that the language effect is reversed for "when"; the score for Thai is higher than the score for English, and the score for Lisu is between English and Thai, however this effect is not significant according to Newman-Keuls oneway analysis of variance.

There was an effect of Age group for all connectives. In all three languages performance increases with age. We can see from Appendix 13 that the standard deviation generally decreases with age, and the variation for Age group 4 is small or non-existent, especially for the relatively easy to acquire connectives, eg. "then", "together". This is due to the scoring system of the task, which has a maximum score of 6. Consequently we have to be careful in the interpretation of the results.

There was a significant interaction effect of Language and Agegroup for the connectives "before" and "together", but not for the connectives "then", "after", "while", "when" and "until".

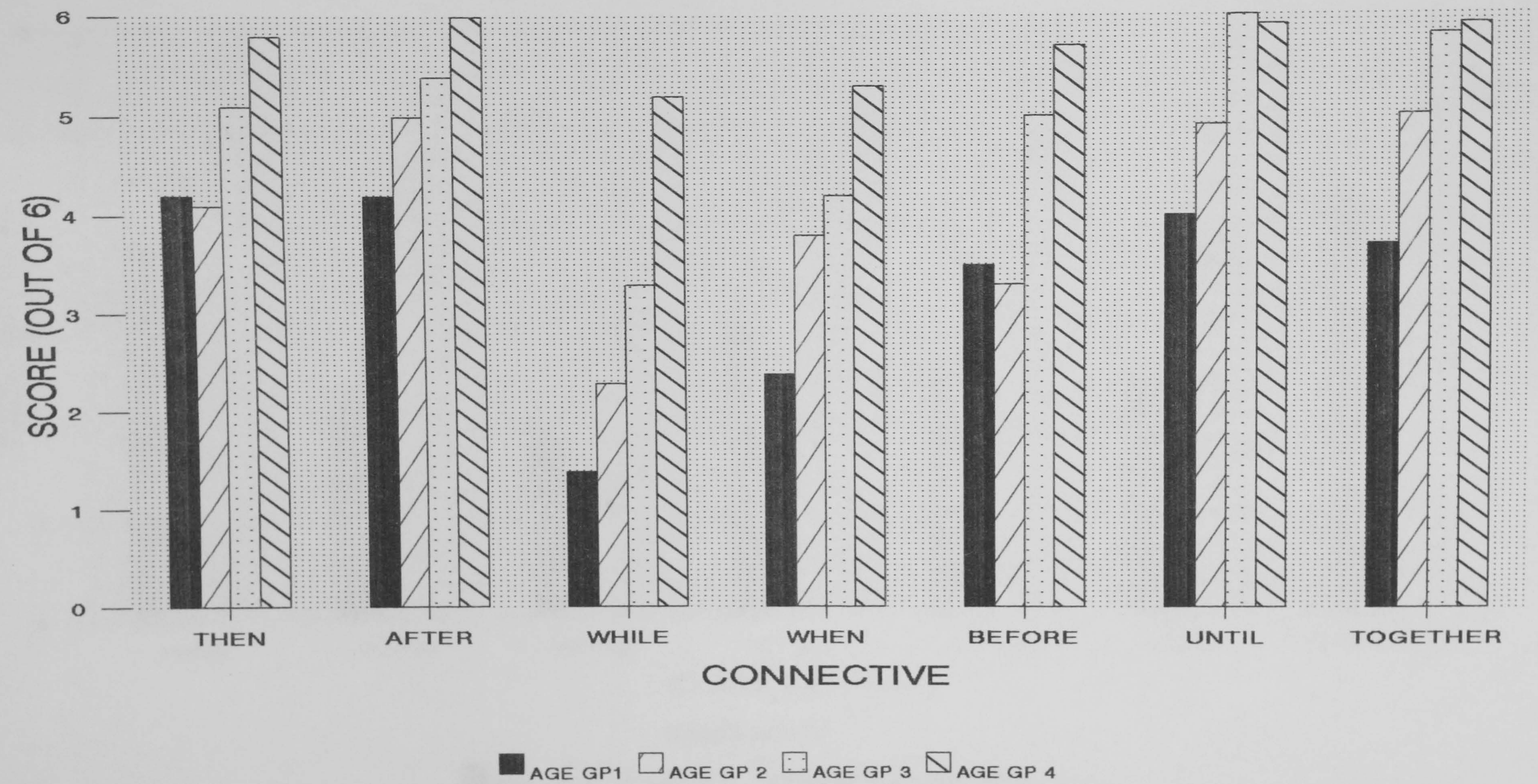
4.3.4 Order of acquisition of Connectives-within language comparisons

From Graph 3a, (data in Appendix 13), for Lisu, we can see that '**while**', '**when**' and '**before**' are relatively slow in acquisition. Whereas '**Together**' , '**then**', '**after**' and '**until**' are acquired with relative ease in this task.

From Graph 3b, (data in Appendix 13), for Thai, we can see that '**until**' and '**while**' are relatively slow in acquisition.

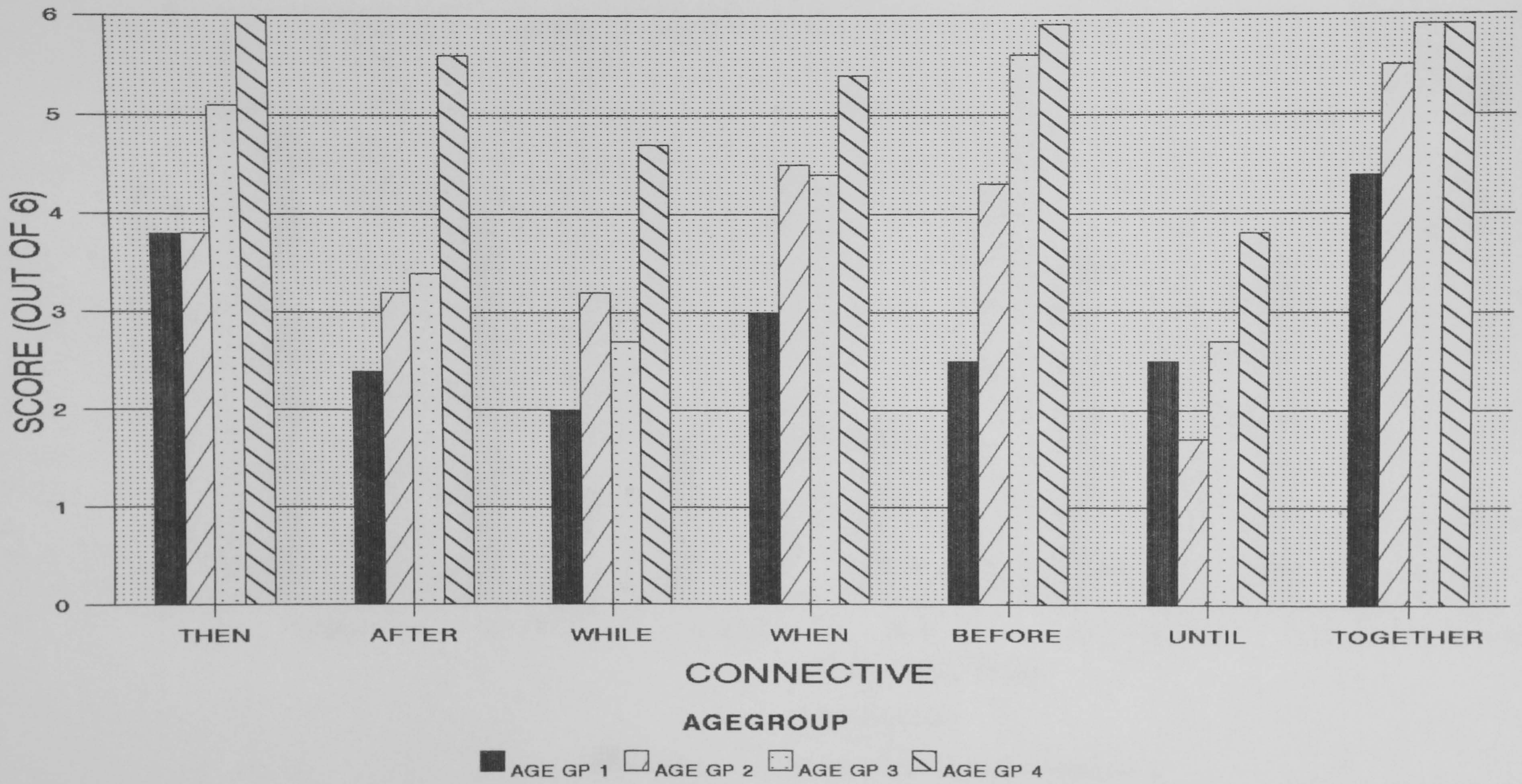
GRAPH 3A LISU MARBLE TASK

AGEGROUP BY CONNECTIVE



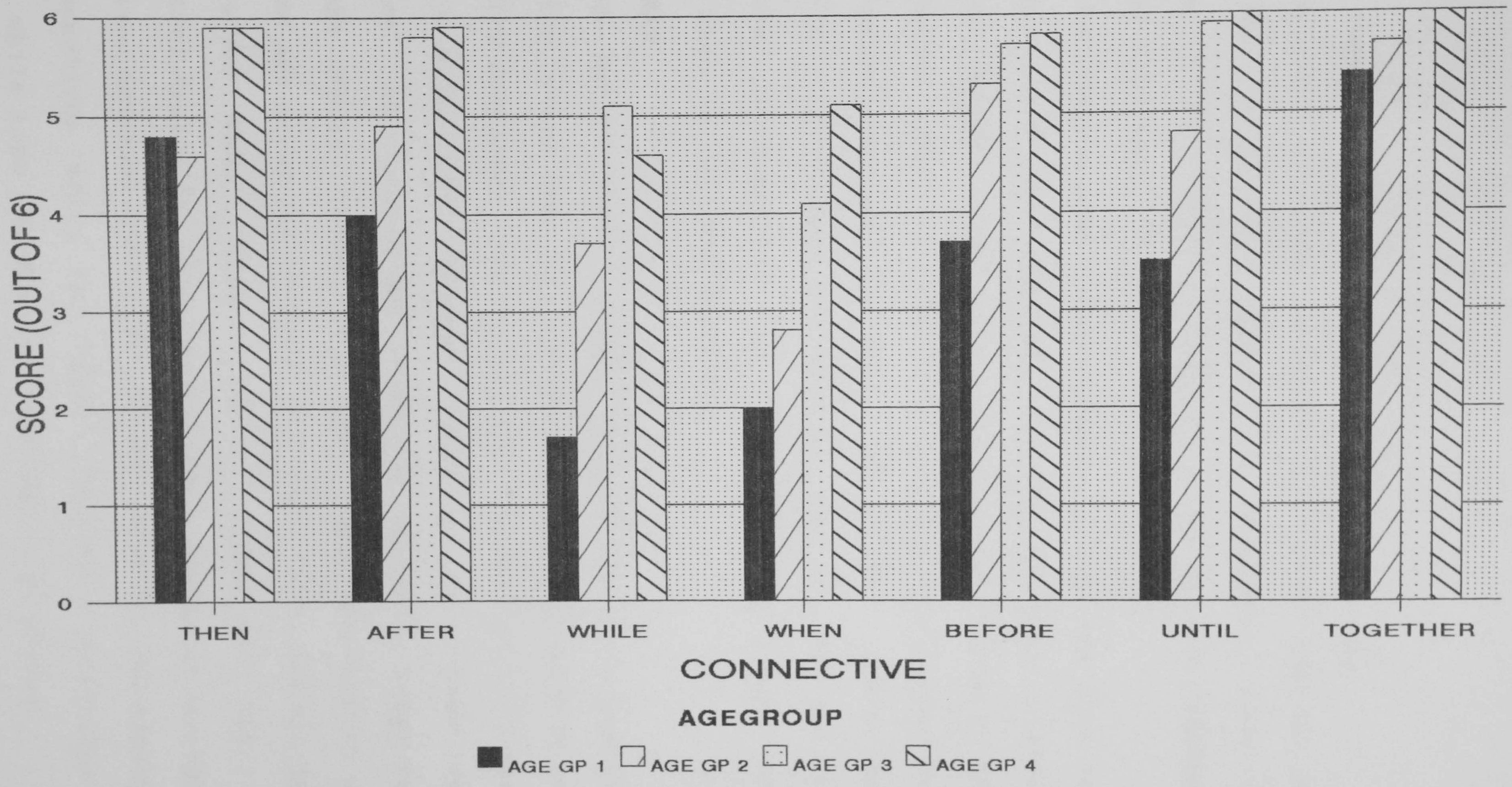
GRAPH 3B THAI MARBLE TASK

AGEGROUP BY CONNECTIVE



GRAPH 3C ENGLISH MARBLE TASK

AGEGROUP BY CONNECTIVE



'then' and 'together' are acquired with relative ease.

From Graph 3c, (data in Appendix 13), for English, we can see that 'while' and 'when' are relatively slow in acquisition. 'after', 'then', 'together', 'until' and 'before' are acquired with relative ease.

If we compare these three graphs, we can see that for all languages 'then' and 'together' are acquired with relative ease, whereas 'while' is relatively slow in acquisition in all three languages. 'when'is relatively late in acquisition for Lisu and English but not for Thai. 'after' and 'until' are acquired with relative ease for Lisu and English, but not for Thai. 'before' is relatively slow in acquisition in Lisu, but relatively fast in Thai and English.

4.3.5 Summary

In the Marble task, overall English children perform significantly better than Thai children. Lisu children were not significantly different from either Thai or English children. There was a significant language effect for all connectives except "when". As expected performance increases with age for all language groups. There was a significant interaction of language and age group for 'before' and "together", but not for the connectives 'then', 'after', 'while', 'when' and 'until'. A contributing factor for this is the scoring system of the task with its fixed maximum score of 6 - this gives a ceiling effect. For the connectives 'after' and 'until', Thai has a particularly low score, while Lisu and English both have high scores.

In all three languages it seems that "then" and "together" are acquired with relative ease. "while" is relatively slow in

all three languages. "**when**" is relatively late in acquisition for Lisu and English, but not for Thai. "**after**" and "**until**" are acquired with relative ease for Lisu and English but not for Thai. "**before**" is relatively slow in acquisition in Lisu, but relatively fast in Thai and English.

4.3 TOY TASK

4.3.1 Scoring

A score of '1' or '0' was given for each trial depending on if the response was correct or not. Each child was given 6 trials for each connective. The total score for each child's response to each connective was scored out of 6. In each age group there were 10 children from each language group.

4.3.2 Overall Analysis

Table 21 The overall means for each age group in the different languages (See Graph 4).

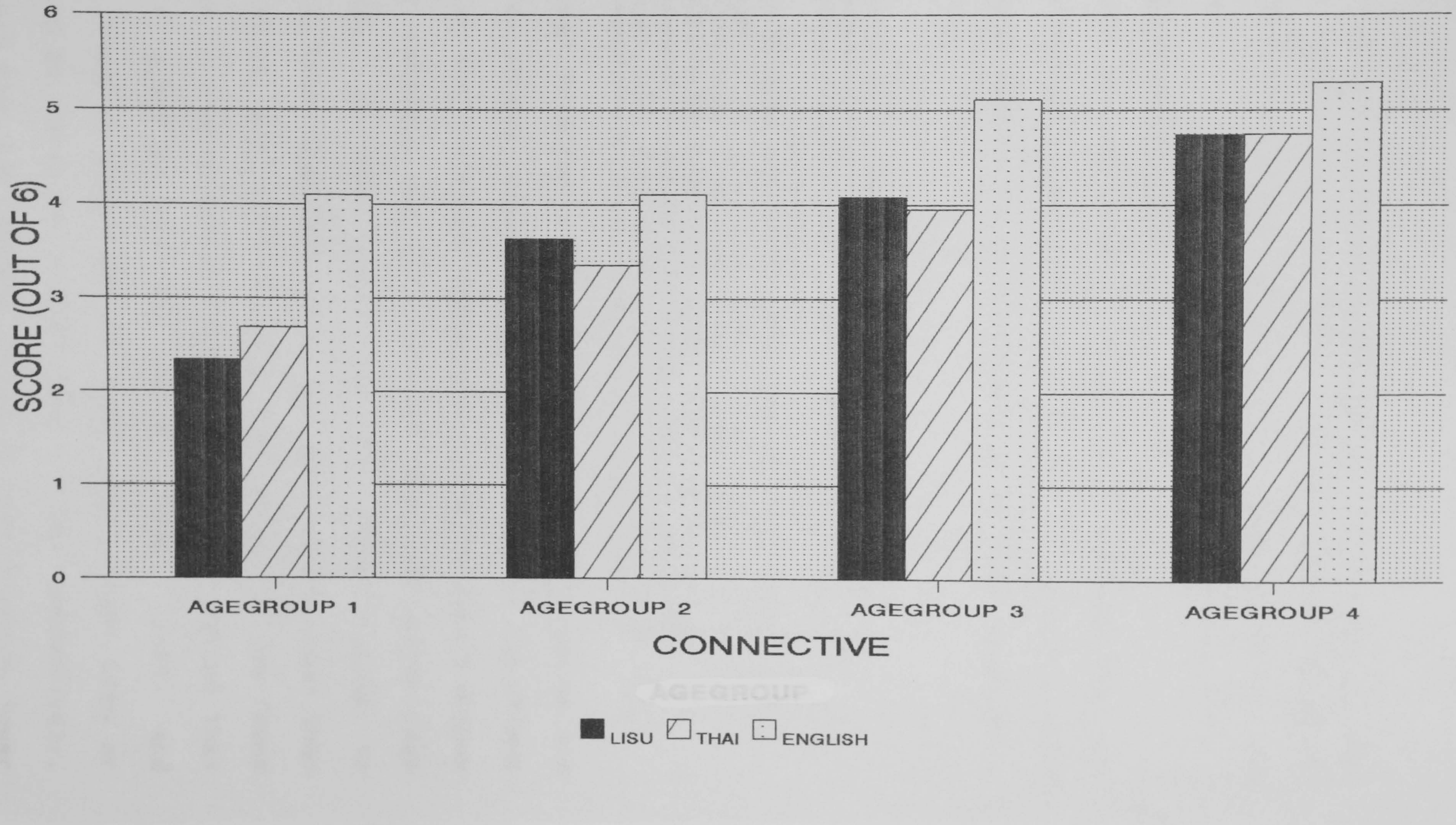
	(Score out of 6)			
	LISU	THAI	ENGLISH	MEANS
AGEGROUP 1 (3;7-4;6)	2.34	2.69	4.10	3.04
AGEGROUP 2 (4;7-5;6)	3.64	3.36	4.11	3.70
AGEGROUP 3 (5;7-6;6)	4.09	3.95	5.11	4.38
AGEGROUP 4 (6;7-7;6)	4.74	4.75	5.29	4.93
MEANS	3.70	3.69	4.65	4.01

A Multifactorial Analysis of Variance on SPSSX was used to examine the effects of age and language on performance, both overall and for each connective. The analysis revealed a main effect of language (Pillais: Approx. F=7.45, Hypoth. d.f. 16 $p<0.01$), a main effect of Agegroup (Pillais: Approx. F=3.31, Hypoth d.f. 24 $p<0.01$). There is a significant interaction effect between language and age group (Pillais: Approx. F=1.54, Hypoth. d.f. 48 $p<0.05$}. These effects are shown in Table 21.

The main effect of language was because English performance was significantly higher than Lisu and Thai. Lisu and Thai were not significantly different (F=10.61, d.f. 2,117 $p<0.01$ Newman-Keuls oneway analysis of variance - see Appendix 14).

The main effect of Age group was because performance

GRAPH 4 TOY TASK
LANGUAGE BY AGEGROUP



increases with age, in all language groups. All age groups were found to be significantly different from each other, (F=20.41, d.f. 3,116 p<0.01 Newman-Keuls oneway analysis of variance - see Appendix 14).

4.3.3 Analysis of Connectives

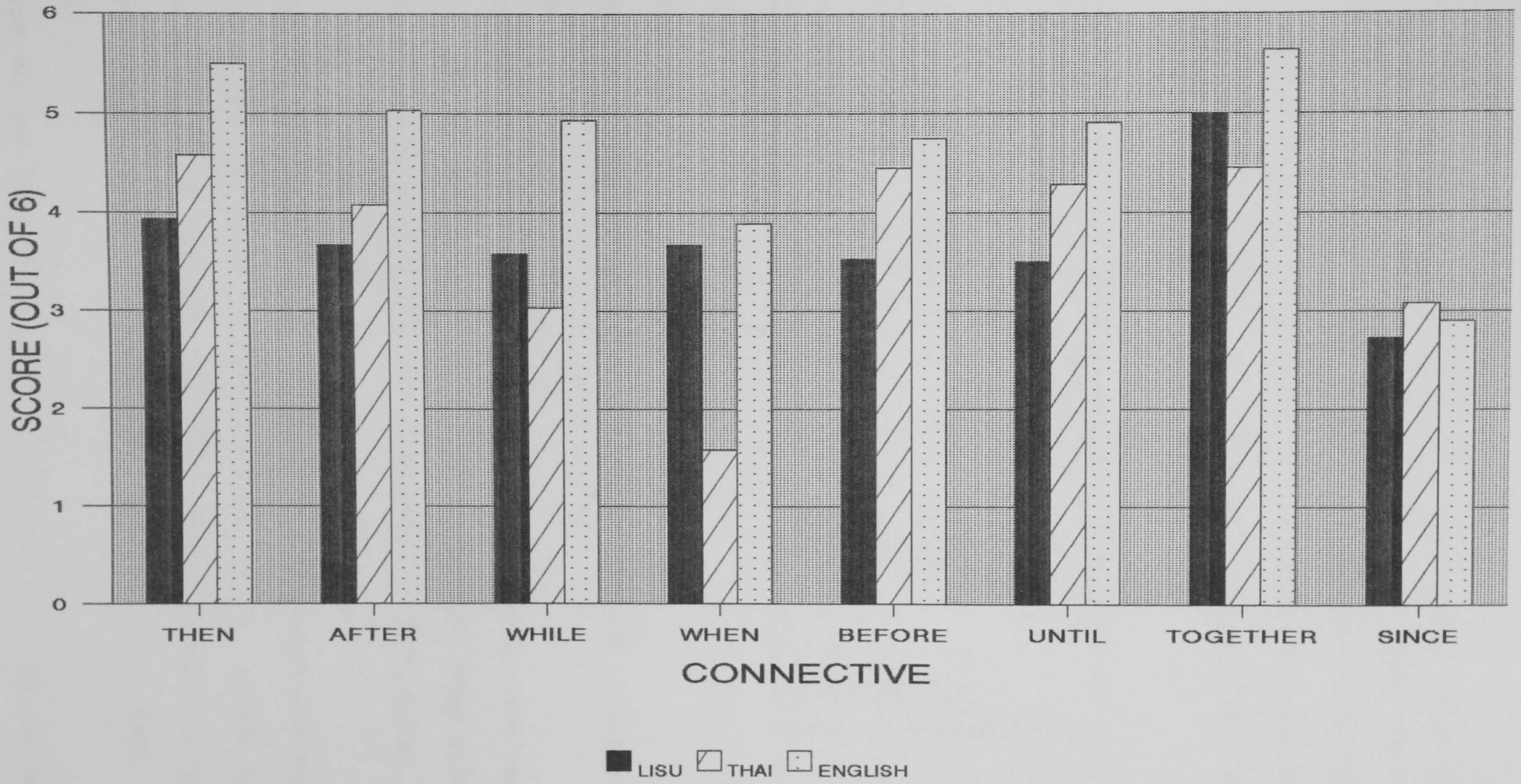
There was a significant effect of language for all connectives except "since". This can be seen in Table 22, which gives the mean scores for each connective and each language, (see Graph 5).

Table 22 The mean scores for each language and connective

	(Score out of 6)								
	THEN	AFTER	WHILE	WHEN	BEFORE	UNTIL	TOGETHER	SINCE	MEANS
LISU	3.93	3.68	3.58	3.68	3.53	3.50	5.00	2.73	3.70
THAI	4.58	4.08	3.03	1.58	4.45	4.28	4.45	3.08	3.69
ENGL.	5.50	5.03	4.93	3.89	4.75	4.90	5.63	2.90	4.69
MEANS	4.67	4.26	3.84	3.04	4.24	4.23	5.03	2.90	4.03

It can be seen from Table 17 that for "since", the scores are similarly low across languages. In order to examine the effect of language on the individual connectives, a Newman-Keuls oneway analysis of variance was performed for each connective (see Appendix 18). It was found that for "then", Lisu is significantly lower than Thai, which is significantly lower than English (F=15.23, d.f. 2,117 p<0.01). For "after" it was found that English is significantly higher than either Lisu or Thai (F=9.05, d.f. 2,117 p<0.01). For "while", "when", "until" and "together", Thai is significantly lower than either Lisu or English (F=15.89, F=16.34, F=6.20, and F=7.58, respectively, d.f. 2,117 p<0.01). For "before", Lisu is significantly lower than either Thai or English (F=5.79, d.f. 2,117 p<0.01).

GRAPH 5 TOY TASK
LANGUAGE BY CONNECTIVE



There was a significant effect of age group for all connectives except "when". Examining Table 23, for "when" we can see that for the overall age group means, Age groups 1 and 2 are higher than Age group 3. This trend is followed by Lisu and Thai. For English, Age group 1 (3;7-4;6) is higher than Age group 2 (4;7-5;6) or Age group 3 (5;7-6;6).

Table 23 The mean scores for each age group and language for the connective "when".

	(Score out of 6)			
	LISU	THAI	ENGLISH	MEANS
AGEGROUP 1 (3;7-4;6)	3.20	1.50	4.20	2.97
AGEGROUP 2 (4;7-5;6)	3.70	2.30	3.20	3.07
AGEGROUP 3 (5;7-6;6)	3.10	1.20	3.60	2.63
AGEGROUP 4 (6;7-7;6)	4.70	1.30	4.50	3.50
MEANS	3.68	1.58	3.88	3.04

Examining Graph 5, we can see that 'when' for Thai is very low compared with English or Lisu.

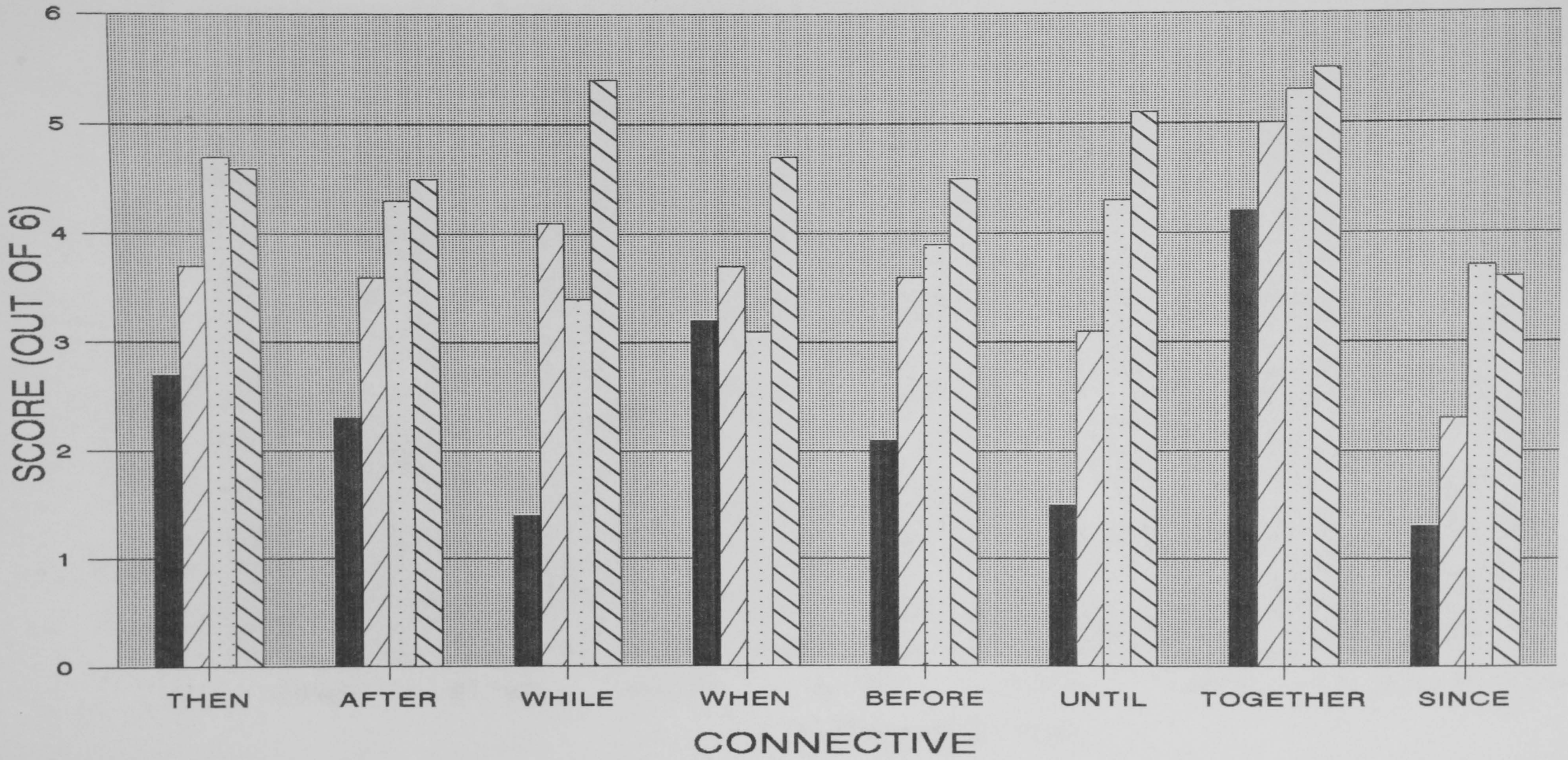
4.3.4 Order of acquisition of connectives-within language comparisons

From Graph 6A for **Lisu**. (data in Appendix 14} we can see that **since, until, while** (Age group 1 (3;7-4;6)) and **when** (Age group 3 (5;7-6;6)) are slow in acquisition. **together** in particular is relatively fast in acquisition.

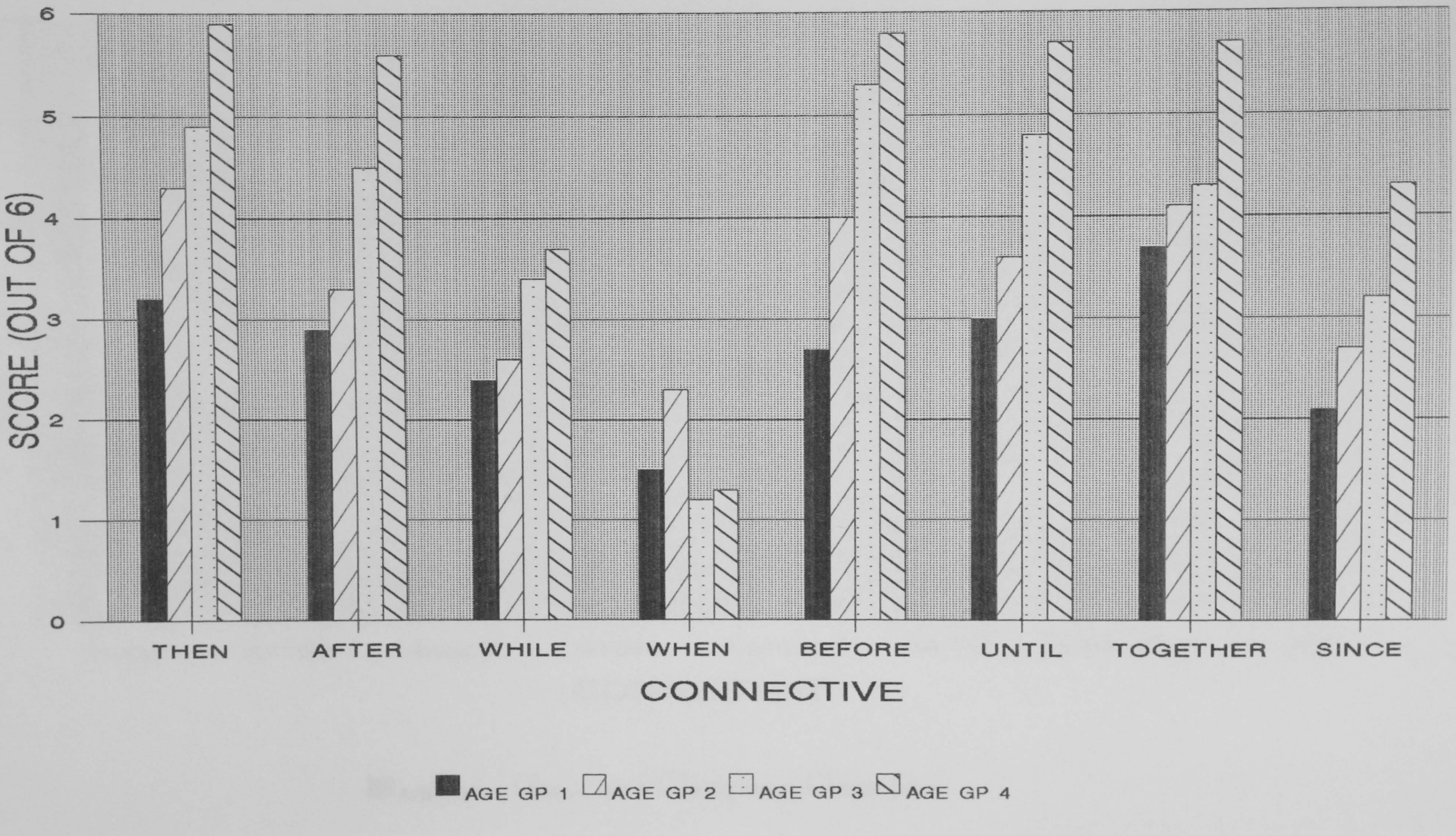
From Graph 6B for **Thai**, (data in Appendix 14} we can see that **when** in particular is slow in acquisition. **while, since** and **before** (Age group 2 (4;7-5;6)) are also slow in acquisition. Whereas **then, until, after** and **together** are relatively fast in acquisition.

From Graph 6C for **English**, (data in Appendix 14) we can see that **since** and **when** are slow in acquisition, whereas **together**

GRAPH 6A LISU TOY TASK
AGEGROUP BY CONNECTIVE

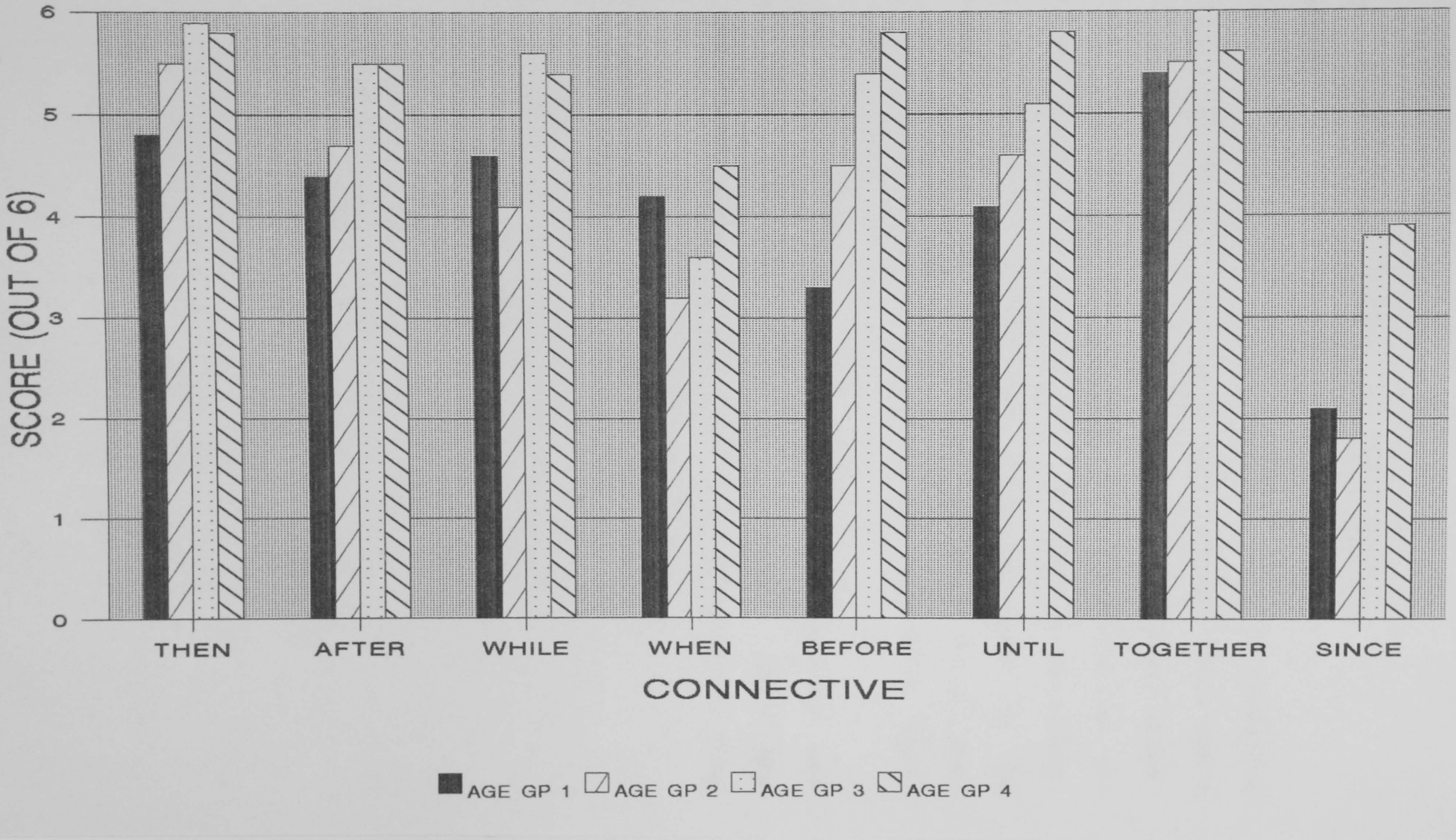


GRAPH 6B THAI TOY TASK
AGEGROUP BY CONNECTIVE



GRAPH 6C ENGLISH TOY TASK

AGEGROUP BY CONNECTIVE



and **then**, in particular are fast in acquisition.

4.3.5 Summary

In the Toy task, overall the English children performed significantly better than Thai or Lisu children. There was a significant language effect for all connectives, except 'since' where Thai, Lisu and English children all have a similar low performance score. As expected Lisu, Thai and English childrens' performance increases with age. The connective 'when' is the only connective which does not show an age group trend. Thai children have a particularly low score for the connective "when" in this task.

In this task it appears that "then" and "together are relatively fast in acquisition for all languages. "when" and also "while" seem to be a problem for Thai children in this task.

4.4 ELICITED IMITATION TASK I

4.4.1 Scoring

Each imitation was assigned a rank score from 1-7 points with 7 points for a perfect imitation and one point for no response or an entirely incorrect imitation. The following scoring scale is taken and adapted from Keller-Cohen (1981).

7 - Perfect imitation, e.g. "The girl brings the water before the boy lights the fire".

6 - The stimulus sentence is imitated correctly, but the temporal relationship is expressed in a synonymous lexical form, e.g. "After the girl brings the water, the boy lights the fire".

5 - The temporal connective is reproduced correctly or synonymously, but the remainder contains no more than one lexical error and one grammatical error, e.g. The girl brings the water before the boy brings the fire", "The girl is fetching the water before the boy lights the fire".

4 - The temporal connective is reproduced correctly or synonymously, but the remainder contains several lexical or grammatical errors. Furthermore, in each clause at least two of the major constituents (SVO) had to be correctly imitated (SV, VO, or SO).

3 - The two SVO sequences are correctly imitated, but the connective is either incorrect or absent, e.g. " The girl brings the water, the boy lights the fire", "The girl brings the water and the boy lights the fire".

2 - One SVO sequence is imitated correctly. The connective may be incorrect or absent and the other SVO sequence may be incorrectly imitated or absent, e.g. "The girl brings the

water", "The girl brings the water when the boy sings a song", or two of the SVO sequence in each clause is imitated correctly, e.g. "brings the water lights the fire".

1 - No response or everything is incorrectly imitated, e.g. "The girl sings a song".

"and" and "when" substitutions were considered incorrect in response to both sequence and simultaneity, since they could not be interpreted unambiguously. In Lisu, omission of the connective "then", providing the rest of the sentence was correctly imitated, was given a score of "6", as it was considered to be a synonymous means of expressing sequence of two clauses in Lisu.

Each child was given 4 trials for each connective, with a maximum score of 7 for each trial. The total score possible for each child's response to each connective was 28. In each age group there were 10 children.

4.4.2 Overall Analysis

Table 24 shows the overall means for each age group in the three different languages (also see Graph 7).

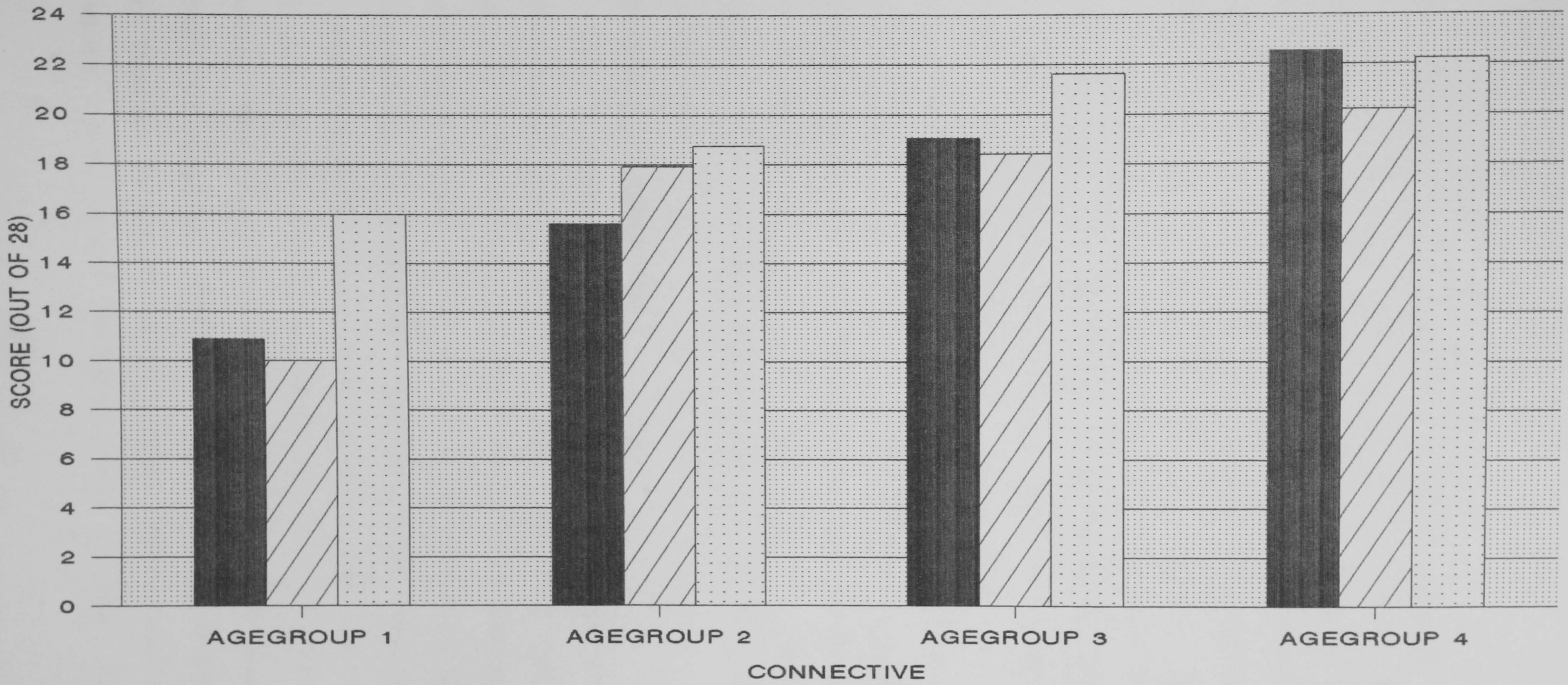
Table 24 The overall scores or each age group in the three different languages (See Graph 7).

	(Score out of 28)			
	LISU	THAI	ENGLISH	MEANS
AGEGROUP 1 (3;7-4;6)	10.93	10.03	15.99	12.32
AGEGROUP 2 (4;7-5;6)	15.64	17.93	18.74	17.44
AGEGROUP 3 (5;7-6;6)	19.07	18.43	21.64	19.71
AGEGROUP 4 (6;7-7;6)	22.56	20.19	22.23	21.66
MEANS	17.05	16.65	19.65	17.78

A Multifactorial Analysis of Variance on SPSSX, was used to examine the effects of age and language on performance both

GRAPH 7 ELICITED IMITATION TASK

OVERALL SCORES OF EACH AGEGROUP



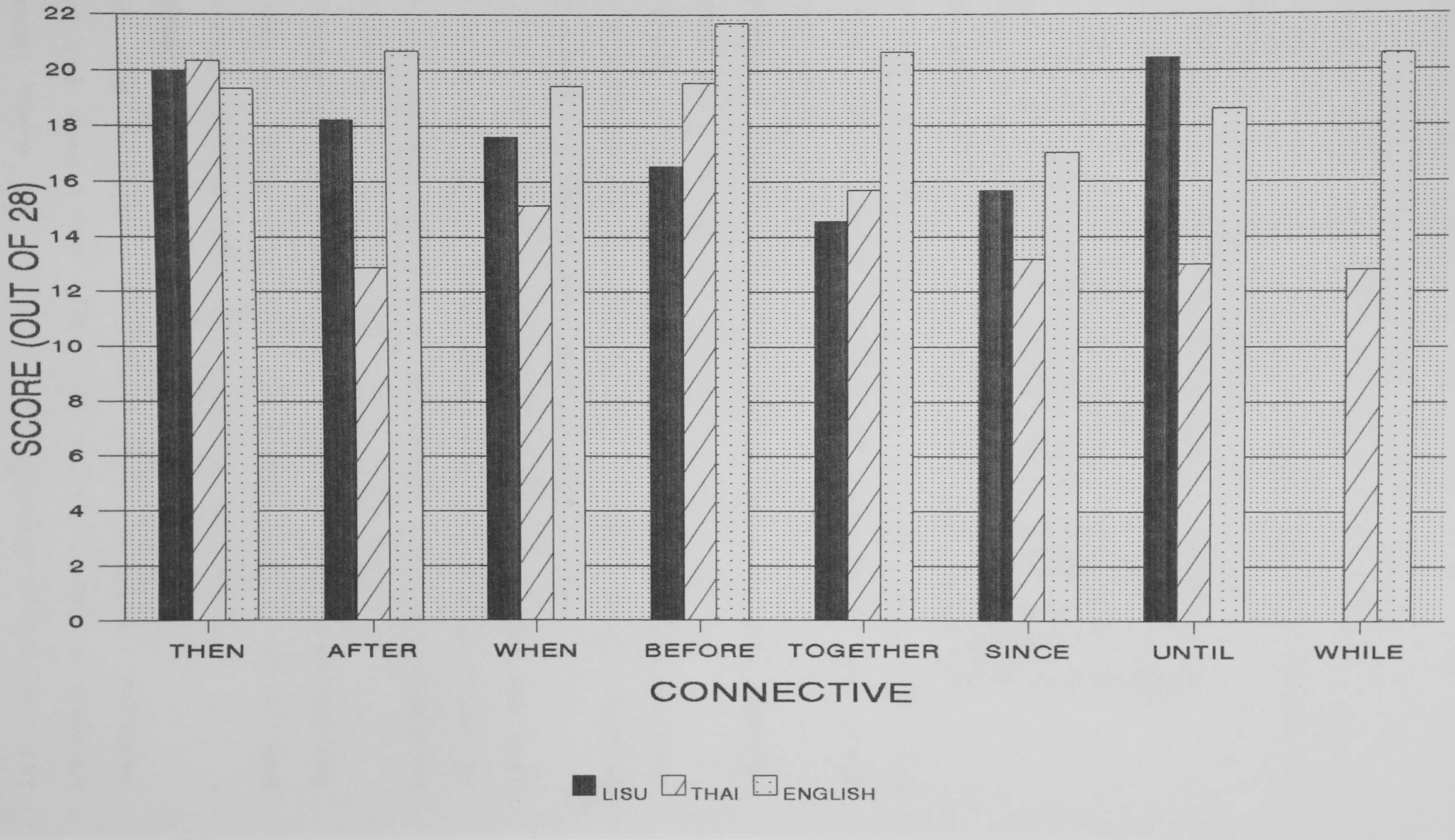
overall and for each connective. The analysis revealed a main effect of language (Pillais: Approx. F=13.77, Hypoth. d.f. 14 p<0.0) and a main effect of age group (Pillais: Approx. F=4.27, Hypoth. d.f. 21 p<0.01). There is a significant language by age group effect (Pillais: Approx. F=1.49, Hypoth. d.f.=42 p<0.05). These effects are shown in Table 19. The main effect of language was due to the performance of English being higher than Thai and Lisu, and Thai and Lisu were not significantly different (F(2,117)=4.40 p<0.05 Newman-Keuls oneway analysis of variance - see Appendix 15).

The main effect of age group was due to Age group 2 (4;7-5;6) scoring higher than Age group 1 (3;7-4;6), and Age groups 3 and 4 scoring higher than Age group 2 (4;7-5;6). Age groups 3 (5;7-6;6) and 4 (6;7-7;6) were not significantly different, (F(3,116)=24.90, p<0.01 Newman-Keuls oneway analysis of variance - see Appendix 15).

4.4.3 Analysis of Connectives

There was a significant effect of language for all connectives, except for 'then' and 'when', which do not differ significantly. A Newman-Keuls oneway analysis of variance was performed on each connective to determine the effect of language on each connective. This revealed that for "after" and "until", Thai is significantly lower than either Lisu or English (F=14.96, d.f. 2,117 p<0.01 and F=17.49, d.f. 2,117 p<0.01 respectively). For "before" Lisu is significantly lower than either Thai or English (F=6.23, d.f. 2,117 p<0.01). For "together" English is significantly higher than either Lisu or Thai (F=9.65, d.f. 2,117 p<0.01). For "since" Thai is

GRAPH 8 ELICITED IMITATION TASK
LANGUAGE BY CONNECTIVE



significantly lower than English (F=3.31, d.f. 2,117 p<0.05). This can be seen in Table 25, which gives the mean scores for each connective (See Graph 8 also).

Table 25 The mean scores for each language and connective

	(Score out of 28)							
	THEN	AFTER	WHEN	BEFORE	TOGETHER	SINCE	UNTIL	WHILE
LISU	20.00	18.25	17.63	16.58	14.58	15.70	20.43	-
THAI	20.35	12.88	15.15	19.55	15.70	13.18	13.00	12.80
ENGLISH	19.35	20.70	19.45	21.70	20.65	17.03	18.60	20.58
MEANS	19.90	17.28	18.24	19.28	17.00	15.30	17.41	16.69

There was a significant effect of Age group for all connectives. There was a significant language by age group effect for "when" only.

4.4.4 Order of acquisition of connectives - within language comparisons

From Graph 9A for **Lisu** (data in Appendix 15), we can see that **together** and **since** are relatively slow in acquisition, whereas **then** and **until** are relatively fast in acquisition.

From Graph 9B for **Thai** (data in Appendix 15], we can see that **together, since, until** and **after** are relatively slow in acquisition, whereas **then** and **before** appear to be acquired with relative ease.

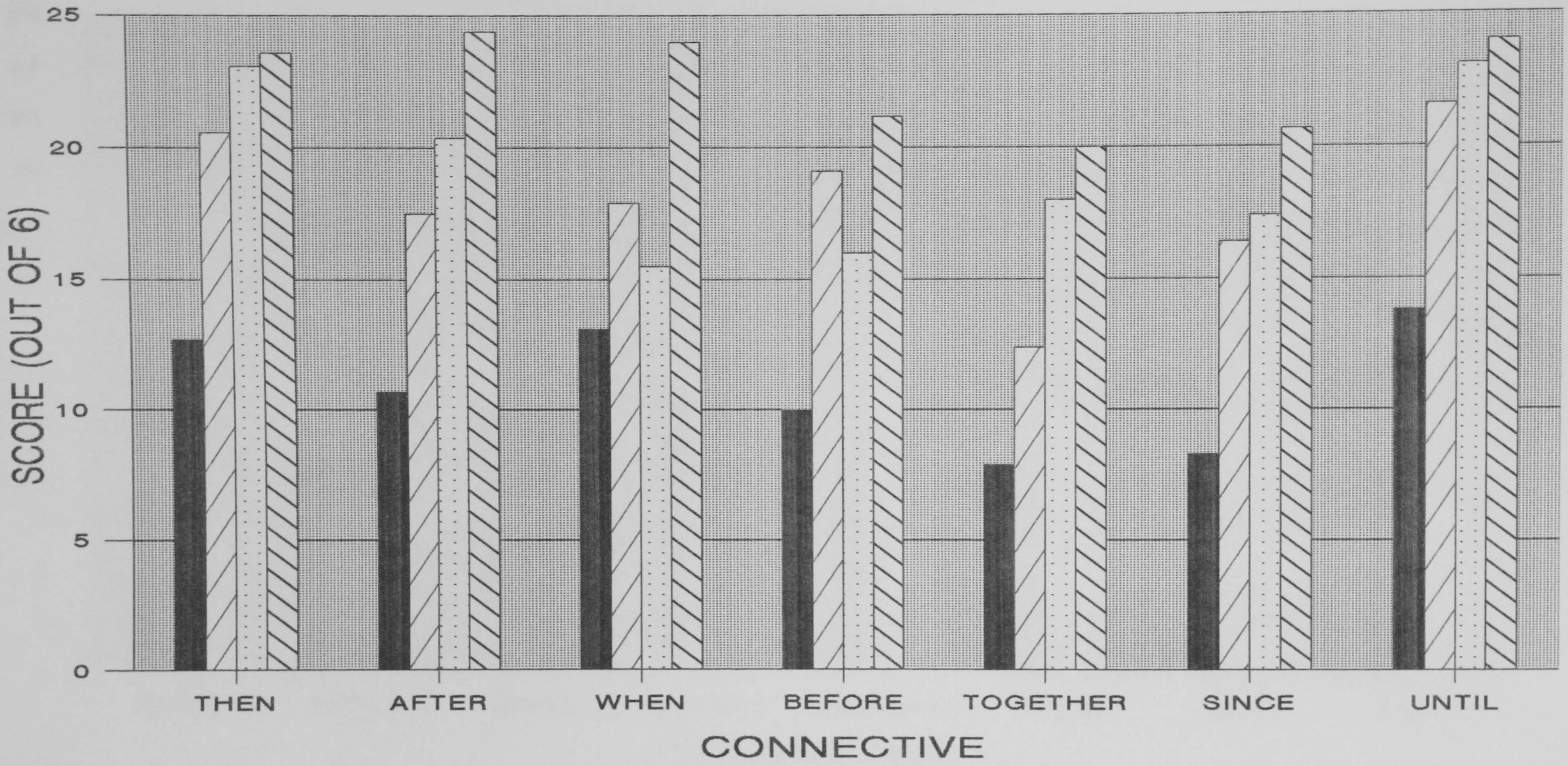
From Graph 9C for **English** (data in Appendix 15), we can see that **since** is relatively slow in acquisition. "until" and "together/at the same time" are slightly retarded.

4.4.5 Summary

In the Elicited Imitation task, English children performed the best. Thai and Lisu children had a similar performance. There was a significant language effect for all

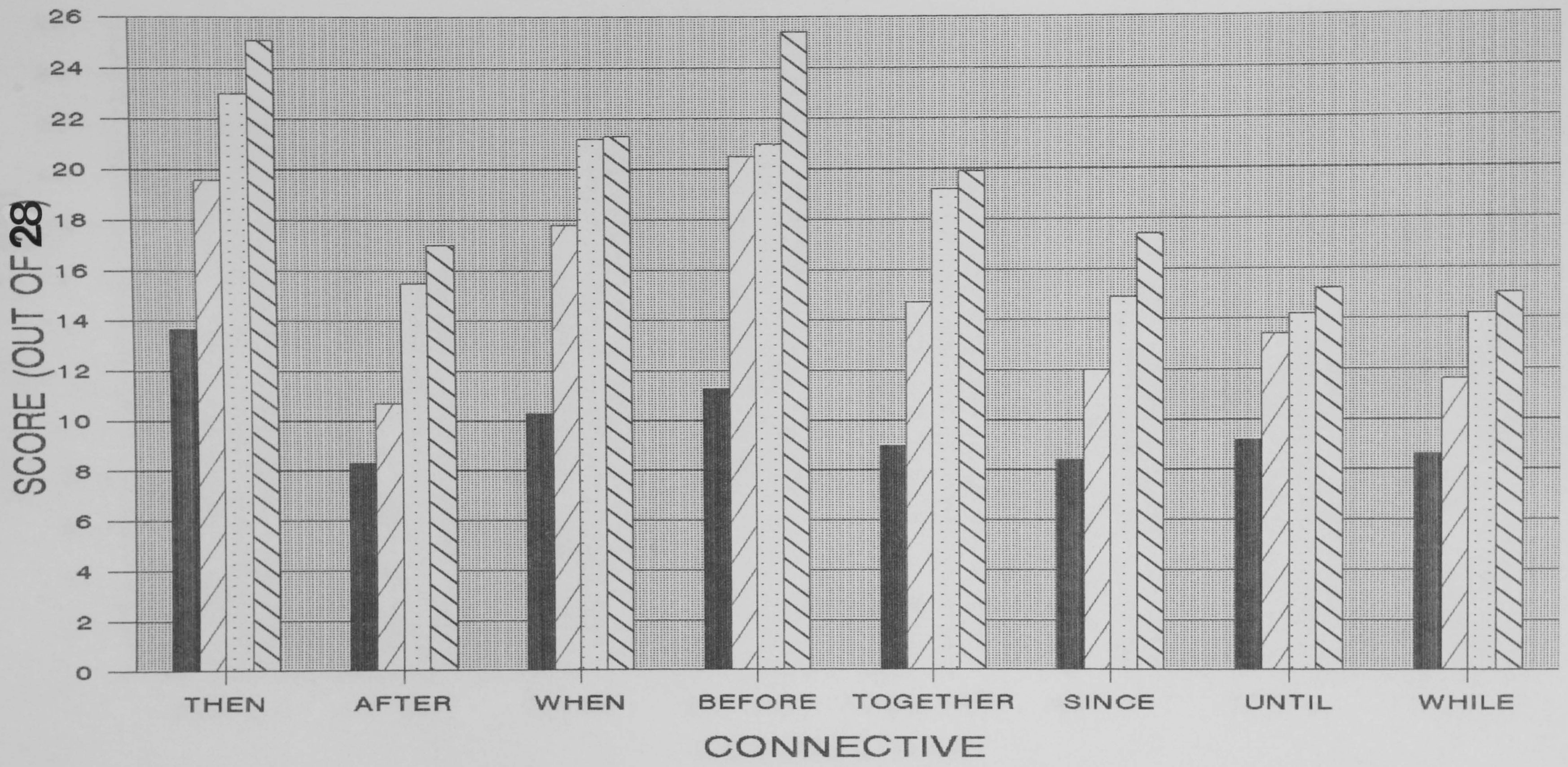
GRAPH 9A LISU ELICITED IMITATION TASK

AGEGROUP BY CONNECTIVE



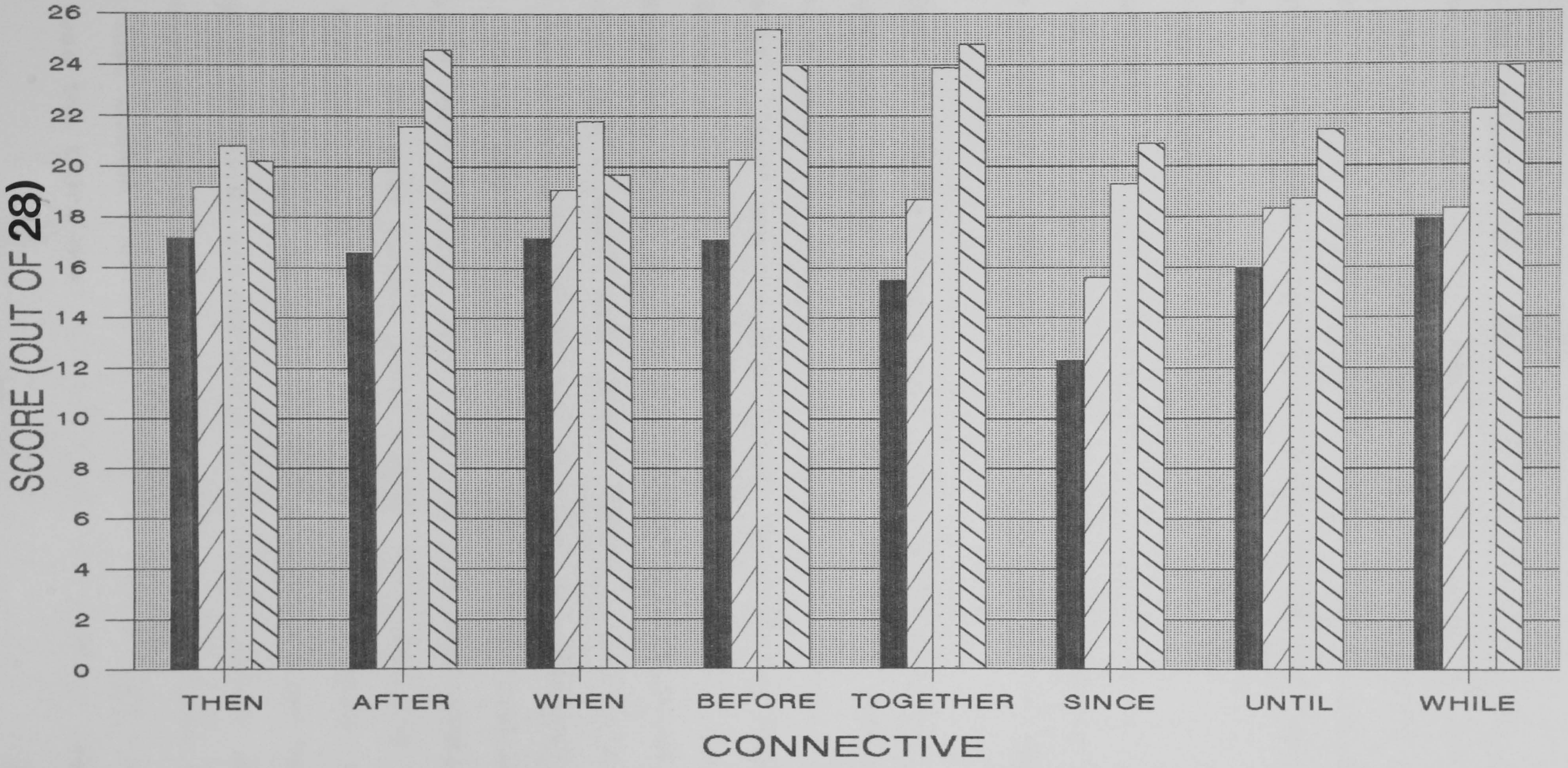
GRAPH 9B THAI ELICITED IMITATION TASK

AGE GROUP BY CONNECTIVE



GRAPH 9C ENGLISH ELICITED IMITATION TASK

AGE GROUP BY CONNECTIVE



connectives, except for 'then' and 'when'. Performance also increased with age, but levelled off by Age group 3 (5;7-6;6), and did not improve significantly between Age groups 3 and 4.

"since" seems to be slow in acquisition in all languages. "together/at the same time" also seems to be difficult for children.

4.4.6 Error Analysis

Substitutions

English children made the most number of substitutions (513), Lisu the second most (230) and Thai the least (61) (see Appendix 21-23).

For English the most common substitution form used was 'and', the second most common used was 'when', the third most common was 'while' and the fourth most common was 'before' (see Appendix 21). 'and' was the most common substitution form used by Age group 1 (3;7-4;6) and Age group 2 (4;7-5;6). For both these age groups 'then' was the most common connective which was replaced by 'and'. 'when' was the most common substitution form used by Age group 3 (5;7-6;6) and 'before' was the next most common. 'while' was the most common substitution form used by Age group 4 (6;7-7;6) and 'when' was the next most common.

For Lisu the most common substitution form was 'bia' which means 'then/until'. This substitution does not occur in Age group 1 (3;7-4;6), but was the most common substitution form for Age group 2 (4;7-5;6) and Age group 3 (5;7-6;6). 'when' was the second most common substitution form for Lisu children and it was the most common substitution form for Age groups 1 and 4. 'after' was the third most substitution form overall (see

Appendix 22).

For Thai the most common substitution form was 'when'. The second most common was 'and'. 'when' was the most common substitution form for all age groups. 'and' was the second most common substitution form for Age groups 1 and 2, it was not used by Age groups 3 and 4 at all. The completed aspect marker 'laew' or 'already' was substituted for connectives in Age group 1 (3;7-4;6) (see Appendix 23 for more detail).

Types of error responses

The different types of responses given by the children to this elicited imitation task were categorised as follows:

(1) one clause only

eg 'the boy sweeps the floor'

(2) one clause given with only a verb and object, no subject given

eg 'sweeps the floor'

(3) connective omitted

eg 'the boy sweeps the floor the girl brings the water'

(4) no 'subjects' used in either clause (with or without a connective)

eg 'sweep the floor (connective) bring the water'

(5) one 'subject' used for two clauses (with or without a connective)

eg 'the boy sweeps the floor (connective) brings the water"

(6) verb replicated, ie the same verb is used in both clauses (with or without connective)

eg 'the boy sweeps the floor (connective) the girl sweeps the water'

(7) object replicated in both clauses (with or without connective)

eg 'the boy sweeps the floor (connective) the girl brings the floor'

(8) Progressive aspect marker omitted.

If we examine Appendix 26(1) we can see that Lisu children, especially Age group 1 (3;7-4;6) make a lot of Type (1), one clause only responses and Type (2), one clause, verb and object only responses. In particular, Age group 3 (5;7-6;6) children make a lot of Type (3), connective omitted responses. Other common error responses for Lisu children were; Type (4), Subject omitted, especially in Age group 1 (3;7-4;6), and Type (5), one subject used for the two clauses.

Thai children, especially Age group 1 (3;7-4;6) made a lot of Type (1), one clause only responses and Type (2), one clause, verb and object only responses. In particular, Age group 3 (5;7-6;6) children made a lot of Type (3), connective omitted responses. Another error responses for Thai children was to omit the progressive aspect marker, this was particularly apparent in Age group 1 (3;7-4;6).

English children, in particular Age group 1 (3;7-4;6) children made many error responses of Type (1), one clause only, though not as many as Lisu or Thai. In particular, Age group 2 (4;7-5;6) and 3 (5;7-6;6} made a lot of Type (3), connective omitted responses. English children also replicated the verb, Type (6) response, in particular Age group 2 (4;7-5;6).

4.5 ELICITED IMITATION TASK II - WITH AND WITHOUT PROGRESSIVE ASPECT MARKERS (PAM).

4.5.1 Overall Analysis

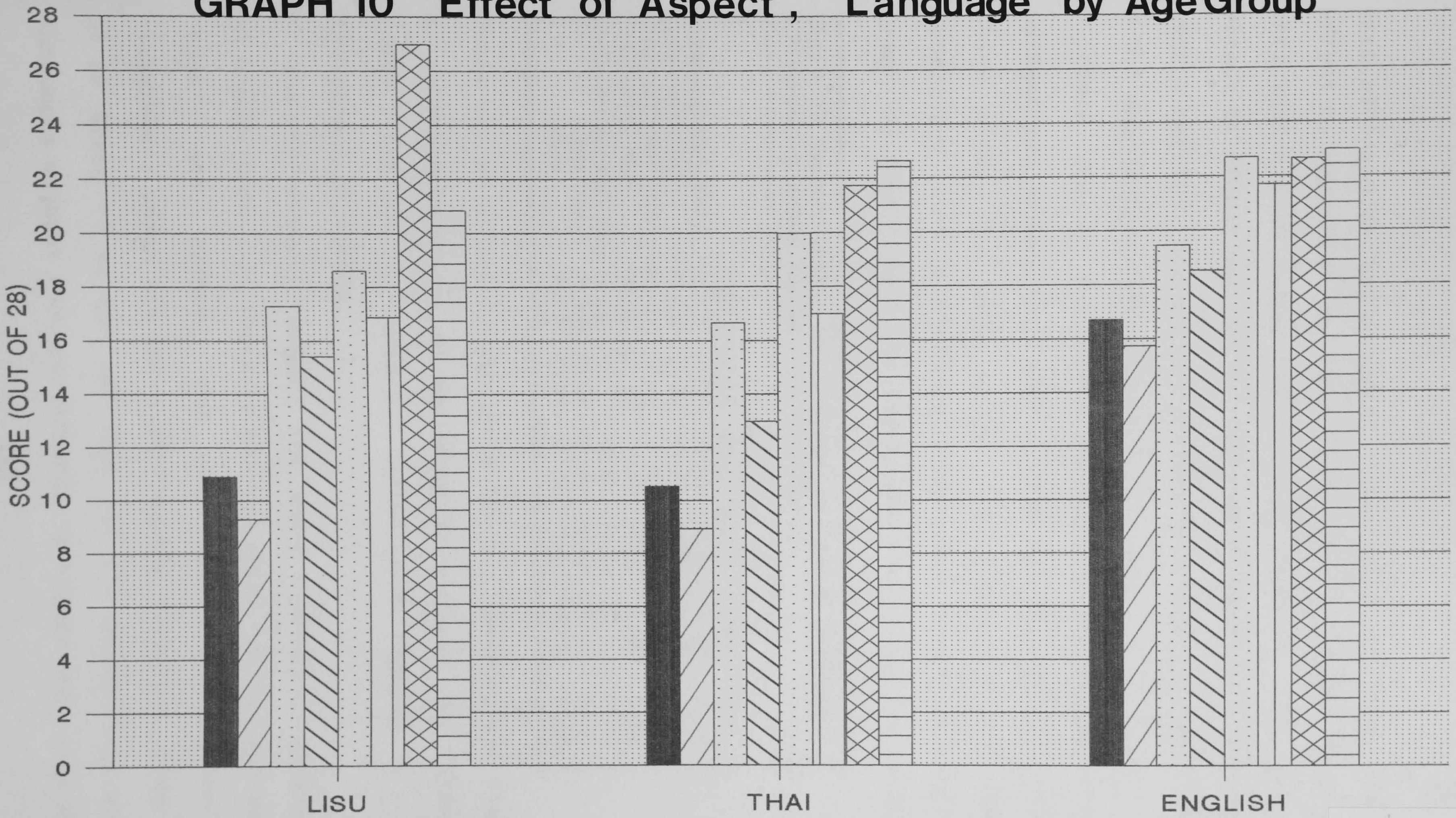
Table 26 shows the overall scores for each age group in the three different languages with and without progressive aspect markers, (see Graph 10).

Table 26 The mean scores for agegroup and language with and without Progressive Aspect Markers,(PAM).

		(Score out of 28)			
		LISU	THAI	ENGLISH	MEAN
AGEGP 1	WITHOUT PAM	10.88	10.52	16.72	12.71
(3;7-4;6)	WITH PAM	9.30	8.94	15.72	11.32
AGEGP 2	WITHOUT PAM	17.30	16.66	19.46	17.81
(4;7-5;6)	WITH PAM	15.42	12.96	18.52	15.63
AGEGP 3	WITHOUT PAM	18.60	19.98	22.70	20.43
(5;7-6;6)	WITH PAM	16.88	16.98	21.70	18.52
AGEGP 4	WITHOUT PAM	26.98	21.74	22.66	23.79
(6;7-7;6)	WITH PAM	20.84	17.88	22.98	20.56
	MEAN	17.03	15.71	20.06	17.60

A Multifactorial Analysis of Variance on SPSSX was used to examine the effects of age, language and aspect on performance for both overall and for each connective. The analysis revealed a main effect of language (Pillais: Approx. F=26.08, Hypoth. d.f. 10 $p<0.01$), a main effect of age group (Approx. F=9.48, Hypoth. d.f. 15 $p<0.01$), and a main effect of aspect (Pillais: F=5.82, Hypoth. d.f. 5 $p<0.01$). There was an interaction of age group and language effect (Pillais: Approx. F=2.44, Hypoth. d.f. 30 $p<0.01$). These effects are shown in Table 21. There was not a significant effect of Age group by aspect, or language by aspect, or Age group by language by aspect. The main effect of language was due to the performance of English being higher than Lisu or Thai. Thai and Lisu were not significantly different

GRAPH 10 Effect of Aspect , Language by Age Group



(F(2,237)=p<0.05 Newman-Keuls - see Appendix 16). The main effect of age group was due to performance increasing with age (F(3,236)=p<0.05 Newman-Keuls - see Appendix 16). The main effect of aspect was due to lower performance with progressive aspect markers than without progressive aspect markers, PAM.

4.5.2 Analysis of Connectives

There was a significant effect of language for all connectives except for 'then'. This can be seen in Table 27, which gives the mean scores for connective in the two conditions, with and without continuous aspect markers, (see Graph 11). For 'then' the scores are similar across languages.

Table 27 The mean scores for language, connective and aspect (Progressive Aspect Marker, PAM) - Graph 11.

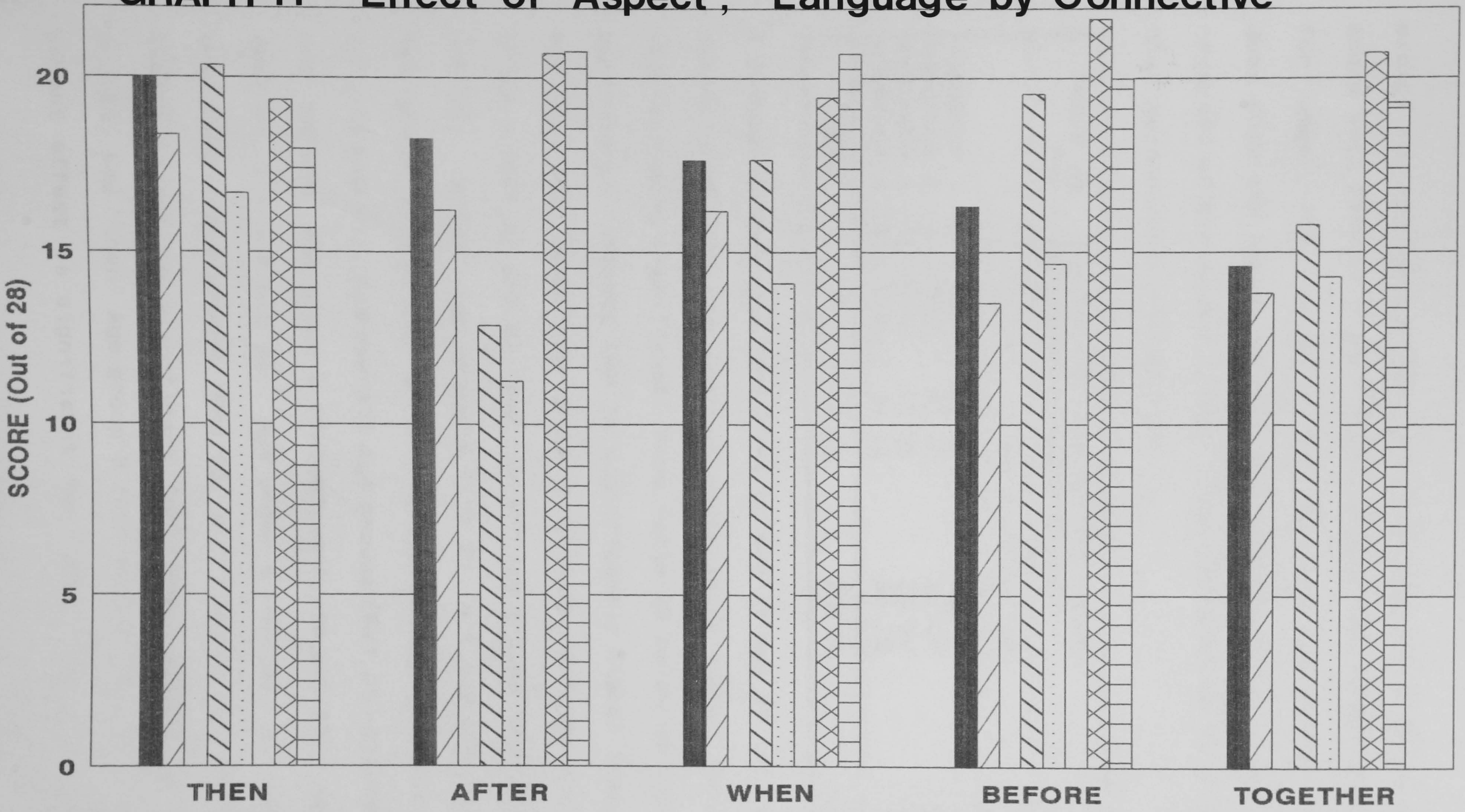
	(Score out of 28)					
	THEN	AFTER	WHEN	BEFORE	TOGETHER	MEAN
LISU-WITHOUT PAM	20.00	18.25	17.63	16.33	14.58	17.36
LISU-WITH PAM	18.35	16.20	16.18	13.53	13.80	14.36
THAI-WITHOUT PAM	20.35	12.88	17.65	19.55	15.70	16.70
THAI-WITH PAM	16.68	11.25	14.10	14.65	14.28	14.20
ENGLISH-WITHOUT PAM	19.35	20.70	19.45	21.70	20.73	20.39
WITH PAM	17.95	20.75	20.70	19.98	19.28	18.91
MEAN	18.78	16.67	17.62	17.62	16.40	16.98

There was an effect of age group for all connectives. There is an interaction effect of age group by language for 'then' and 'when', but not for 'before', 'after' and 'together'.

The effect of Aspect

The main effect of aspect (ie. score without the progressive is higher than with the progressive) holds for the connectives 'then', and 'before', but not for 'after', 'when' and 'together', which are not significantly different. From Table 27 or Graph 11 we can see that for all connectives and all languages without PAM, performance is higher than with PAM,

GRAPH 11 Effect of Aspect , Language by Connective



except for the connective 'when' in English where the overall score with PAM is higher than without PAM. Examining Table 28 for 'when', for English we can see that Age group 1 (3;7-4;6) does show the aspect effect, but Age groups 2, 3 and 4 show a reversal of the aspect effect, with performance with PAM higher than performance without PAM.

TABLE 28 The English scores for 'when.
PAM = Progressive Aspect Marker

	(Score out of 28) WITHOUT PAM	WITH PAM	MEAN
AGEGROUP 1 (3;7-4;6)	17.20	15.30	16.30
AGEGROUP 2 (4;7-5;6)	19.10	20.90	20.00
AGEGROUP 3 (5;7-6;6)	21.80	22.90	22.35
AGEGROUP 4 (6;7-7;6)	19.70	23.70	21.70
MEAN	19.45	20.70	20.10

A grouped t-test was performed to see if any of the scores for connectives with and without progressive aspect markers were statistically significant. From Table 29 below we can see that performance without PAM is significantly higher than with PAM for Thai for "then" Age group 3 ($F=2.28$, $d.f.=18$ $p<0.05$), Age group 4 ($F=5.62$ $p<0.01$) and overall Age groups ($F=1.23$, $d.f.=78$ $p<0.05$), "after" Age group 3 ($F=2.85$, $d.f.=18$ $p<0.05$), "when" Age group 2 ($F=2.80$, $d.f.=18$ $p<0.05$), Age group 4 ($F=1.45$, $d.f.=18$ $p<0.05$), and overall Age groups ($F=1.37$, $d.f.=78$ $p<0.05$) and "before" Age group 2 ($F=2.67$, $d.f.=18$ $p<0.05$), Age group 3 ($F=1.67$, $d.f.=18$ $p<0.05$), Age group 4 ($F=2.25$, $d.f.=18$ $p<0.01$) and overall Age groups ($F=1.68$, $d.f.=78$ $p<0.01$). For Lisu the aspect effect is significant for "when" Age group 1 ($F=3.32$ $p<0.05$) and "then" Age group 3 ($F=4.60$ $p<0.05$). For English the aspect effect is significant for "when" Age group 4 ($F=2.94$,

d.f.=18 p<0.05). For 'when' the aspect effect is reversed, ie. performance with PAM is higher than without PAM, however this is only statistically significant for Age group 4. From these results we can see that Thai is affected by progressive aspect more than either English or Lisu.

TABLE 29 EFFECT OF ASPECT ON CONNECTIVE - Grouped t-test significant values.
A Comparison of the effect of with and without progressive aspect markers,(PAM) on Connectives in the Elicited Imitation Task.

THAI					
CONNECTIVES	AGE GP 1	AGE GP 2	AGE GP 3	AGE GP 4	OVERALL AGE GPS
THEN	–	–	*	**	*
AFTER	–	–	*	–	–
WHEN	–	*	–	*	*
BEFORE	–	*	*	**	**
TOGETHER	–	–	–	–	–

LISU					
CONNECTIVES	AGE GP 1	AGE GP 2	AGE GP 3	AGE GP 4	OVERALL AGE GPS
THEN	–	–	*	–	–
AFTER	–	–	–	–	–
WHEN	*	–	–	–	–
BEFORE	–	–	–	–	–
TOGETHER	–	–	–	–	–

ENGLISH					
CONNECTIVES	AGE GP 1	AGE GP 2	AGE GP 3	AGE GP 4	OVERALL AGE GPS
THEN	–	–	–	–	–
AFTER	–	–	–	–	–
WHEN	–	–	–	–	with PAM>without PAM
BEFORE	–	–	–	–	–
TOGETHER	–	–	–	–	–

The asterisks show the effects of progressive aspect markers on performance. The asterisks show in all cases except 'when' in English, that performance without progressive aspect markers is significantly better than performance with progressive aspect markers (*=significant at the 5% level of significance, **=significant at the 1% level of significance, - =not significant).

4.6 COMPARISONS ACROSS TASKS

Now if we look at Table 30 for a comparison of results across languages, using Newman-Keuls Oneway analysis of variance for language in the different tasks, we can first see that English children perform the best in the Toy task, and perform better than Thai children in the Marble and Elicited Imitation tasks (Lisu children are not significantly different from Thai or Lisu).

For '**then**' English has the highest score for the Marble and Toy tasks, but not significantly different from Thai or Lisu in the Elicited Imitation task.

For '**after**' Thai children have the lowest performance for the Marble and Elicited Imitation tasks. For the Toy task both Lisu and Thai are significantly lower than English.

For "**while**" English children perform significantly better than either Thai or Lisu. In the Marble task there is no significant difference.

For '**when**' Thai has the lowest score in the Toy task. In the Marble and Elicited Imitation task there is no significant difference.

For '**before**' Lisu has the lowest score for the Toy and Elicited Imitation tasks, but not for the Marble task, where there is no significant difference between languages.

For '**until**' Thai is the lowest for the Marble and Elicited Imitation tasks, but in the Toy task Thai is not significantly different from Lisu or English.

For '**together**' English performance is the highest for the Toy and Elicited Imitation tasks. In the Marble task English is not

significantly different from Lisu. Lisu is not significantly different from Thai in all tasks.

For 'since' English children performed significantly better than the Thai children on the Elicited imitation task. In the Toy task there is no significant difference.

TABLE 30

<u>The effect of language on connectives in the different experimental tasks</u>.

NEWMAN-KEULS ONEWAY ANALYSIS OF VARIANCE SUMMARISED - CONNECTIVE BY LANGUAGE (see Appendix 17-20)

	Experimental Tasks		
CONNECTIVE	MARBLE	TOY	E.I.
THEN	English highest	English>Thai Thai>Lisu	N.S.
AFTER	Thai lowest	English highest	Thai lowest
WHILE	N.S.	English highest	-
WHEN	N.S.	Thai lowest	N.S.
BEFORE	N.S.	Lisu lowest	Lisu lowest
UNTIL	Thai lowest	English>Lisu	Thai lowest
TOGETHER	English>Lisu	English highest	English highest
SINCE	-	N.S.	English>Thai
Overall effect	English>Thai	English highest	English>Thai

(Lisu=1, Thai=2, English=3 N.S.= not significant, -= not used in this task, >= is significantly higher than)

CHAPTER 5 - DISCUSSION

5.1 CONVERSATION TASK

5.1.1 Limitations

The questions used in this task, elicited only a very limited sample of the temporal language that the children are capable of producing, and comprehension has been looked at in a very limited way. A small sample of language was elicited under an unnatural situation. The questions also shape the language elicited and the ability of the child is underestimated using this methodology. A full representation of the child's temporal language capacity is not given. A larger sample of language is desirable for analysis and comparisons. Supplementary methodologies are also necessary, such as detailed naturalistic observations and analysis.

5.1.2 Errors

Errors found in the interpretation of 'tomorrow' and 'yesterday', and 'before' and 'after' seem to support the Conceptual Simplicity theory (Keller-Cohen 1981), that concepts which require a child to make fewer discriminations are acquired first, i.e. 'yesterday' and 'tomorrow' are understood as meaning non-present initially and later the distinction between past and future is made. Similarly 'before' and 'after' are first interpreted as meaning non-simultaneous (Type 2 errors - 'before' and 'after' are confused) and only later are the more specific meanings; prior and succeeding comprehended fully. The Type 1 errors, the Event time (ET) is interpreted as the Reference time (RT) or ET=RT, indicate that the child is not linguistically capable of, or has difficulty in making reference

to a separate and distinct RT, non-deictic relational reference, eg. "Before breakfast what do you do?" An incorrect response in interpretation is for example "have toast". However it is to be noted that childrens' responses in the Conversation Task were relatively error free, and so even the youngest children, Age group 1 (3;7-4;6) are capable of making these finer distinctions to some extent.

5.1.3 Length of Response

English children replied in a lengthier manner than Lisu children, who responded at greater length than the Thai children There are several possible reasons for this (1) familiarity or lack of familiarity with this type of task, (2) language character - Thai and Lisu are more economical, discourse type languages - the number of clauses used levels off after Age group 2 (4;7-5;6) in Thai and Lisu, whereas in English it continues to increase with age, (3) task environment - possibly Thai children would have responded more if they were interviewed outside the school environment, (4) cultural factors - Thai children are more shy and inhibited, especially in the presence of a stranger, due to cultural factors. Also when an adult addresses the child, he or she perhaps feels that he/she has to respond in this economical way (see Language Socialisation chapter 2).

5.1.4 Temporal Connectives

English children used more temporal connectives in this task than Thai or Lisu children. This again reflects differences in these languages (see Introduction section for characteristics of these languages summarised). In Thai or Lisu, the connective

often does not have to be specified, it is inferred or other devices are used, eg. double verbs, or the meaning is understood from the context without being grammatically expressed,

eg. in Thai "rao pai seu kong"

we go buy thing(s)

in English "We go and buy some things"

eg. in Lisu "noo ami-thae amyee-wa gyi yi la ngo"

you yesterday-when field to go return come nom.qu.

in English "Did you go to the field and come back yesterday?"

In all age groups and all languages, addition and sequence of clauses was either inferred as in Thai or Lisu, or grammatically marked as in English. The Thai and Lisu children did not generally overtly mark sequence and addition in this task. This lack of overt marking of temporal connectives in Thai and Lisu could affect the results in the experimental tasks, where grammatical expression of the temporal connective is forced on the child. The task sentences are perhaps an unnatural way of expressing the meanings intended, especially in Lisu. Samples of more natural language are required to examine the actual usage of these temporal connectives in natural language.

Research has found that children generally use 'before' and 'after' as prepositions before they use them as conjunctions. Certainly in this task there was more frequent use of these connectives as prepositions rather than conjunctions in the English children. The aim of the experimental tasks was to examine the acquisition of temporal connectives in greater detail.

5.1.5 Temporal Adverbial Phrases

According to Smith (1980) children begin to use temporal adverbials well after they have developed the ability to produce other adverbials. Adverbials which carry tense emerge during the Third stage in English (about 2;6 onwards) (Fletcher 1979) and in Mandarin Chinese (about 2;2 onwards) (Erbaugh 1981). Both future and past reference were found to be supported by adverbials at this stage. Harner (1975) found correct comprehension of these forms around 3;0 years in English. Deictic temporal adverbials were found in this study, in English Age group 1 (3;7-4;6) and Lisu Age group 2 (4;7-5;6) children, both referring to future and past reference. Correct comprehension was shown by some Age group 1 (3;7-4;6) children and most Age group 2 (5;7-6;6) children in all languages, only relatively few errors were detected. Temporal adverbial constructions with 'when' emerge in English, German, Italian and Turkish in the third stage about 2;6 years (Clancy et al 1976). 'when' constructions were evident in this study in Age groups 1 (3;7-4;6) and 2 (4;7-5;6) for English. This construction is reported to precede the use of 'before' and 'after' as prepositions. The use of 'before' and 'after' as prepositions are evident in English Age group 1 (3:7-4;6) children.

English children used a lot more temporal adverbials than Thai or Lisu children. In fact Thai children did not use temporal adverbials at all in this task. Age group 4 (6;7-7;6) English children produced the most diverse usage of temporal adverbials (see Tables 11-14). The shortage of temporal adverbials in the Thai and Lisu data is due to the fact, that

Thai and Lisu are more discourse oriented languages than English is, English society is a more time oriented society than Thai or Lisu, and also the English children perhaps due to familiarity with this type of task responded in a lengthier manner.

5.1.6 Aspect

Progressive aspect

In English, according to Brown (1973) and other researchers one of the first inflections to emerge is the progressive "-ing". In Mandarin Chinese the progressive form emerges in the second stage, at about 1;10 to 2;4 years. Research indicates that by the end of the third year most English speaking children have acquired the progressive morpheme "-ing". The complete imperfective form is indicated by the auxiliary "be" + "-ing". Young children often produce sentences with just the progressive "-ing", and since the auxiliary "be" carries tense, these sentences are opaque as to tense and so contextual information is needed to interpret the sentence with respect to tense. Evidence of this type of usage of the progressive "-ing" without the auxiliary "be" was found particularly in Age group 1 (3;7-4;6), eg. "Dad working", which can be interpreted as either "Dad is working" or "Dad was working".

In English Age groups 1 and 2, progressive aspect marking (PAM) is used most in response to simultaneity questions. It is not used in response to posteriority questions, and only used once with an anteriority question. In Age groups 3 and 4, the past continuous tense was used.

In Lisu Age group 1 (3:7-4;6) children, PAM is used with

posteriority, simultaneity and anteriority questions. It was used most with simultaneity questions. This flexible usage of PAM in Lisu with respect to "tense" probably highlights the ease of acquisition of this postverbal particle. The progressive in Lisu is an easier form to acquire than the English progressive, which is confounded by tense. The Thai children did not use either form of the progressive, ie. either "kamlang" or "yuu". This illustrates the nonobligatory nature of the Thai progressive, in comparison to English or Lisu (see the section about the progressive in the Introduction, page 25).

In Tables 11 to 14, English Age group 1 (3;7-4;6) children used some durative temporal adverbials, eg. "for a long time" and "a long time ago". Age group 2 (4;7-5;6) children used "in the night", Age group 3 (5;7-6;6) children used "till Friday", "still", and "all the time", and Age group 4 (6;7-7;6) used "during", "for a little bit", "in the morning" and "still". Age group 4 children demonstrated the most diverse usage.

The fact that more progressives were used to describe the continuous non-goal oriented past actions than the goal-oriented past actions is clear evidence that the children differentiate linguistically between the progressive and nonprogressive aspect of action in English and Lisu Age group 1 (3:7-4;6) (see Tables 15 and 16). There does not seem to be an age group pattern difference in English or Lisu, which agrees with previous research that progressive aspect is acquired prior to three and a half years. Research on Mandarin Chinese has shown that progressive aspect is acquired by stage 2, 1;10-2;4 years. I would similarly expect the progressive to be acquired early in

Lisu, because of its clause-final position and its regularity in expression.

Completed action/change of state markers

Mandarin Chinese children use the perfective "le" with stative predicates specifying a current relevant state, which resulted from a prior situation as early as stage 2, about 1;10 to 2;4 years. In Thai there is early common usage of the particle "laew" with stative predicates to indicate a change of state, eg. "im laew" - "(I'm} full now", or "paw laew" - "(I've had) enough now". Mandarin Chinese children at this stage also indicate completion with the verb complements "hao" good and "-wan" finish in conjunction with "-le". In Thai Age groups 1 and 2, "set" finish is used by itself or in conjunction with "laew" to indicate completion. In Lisu the particle "woe" is used in Age group 1 (3:7-4;6) to signal completion. From Table 18, we can see that even the youngest Lisu children in this study have already acquired flexible usage of the particle "woe", which agrees with the Mandarin Chinese data, which shows that perfective aspect was used with activity verbs as well as telic verbs by stage 2 (1;10-2;4) children (Erbaugh 1981). These aspect particles in Thai and Lisu should be relatively easy to acquire, as they are placed at the end of the clause and are therefore perceptually salient to the language learning child, and are invariant. The Lisu change of state particle, "liu" was not used by the children in this task. Research has shown that there is a late emergence of the English perfect due to its syntax; the perfect of "have" has different realisations in various syntactic and phonological environs, and semantics; it

not only indicates current relevance, but indicates that a verb begins earlier and continues right up to the present. In the data presented here the English perfect is evident in Age groups 1 and 2.

The Experiential Perfect

Mandarin Chinese children begin to use the experiential perfect in the second stage, 1;10 - 2;4 years (Erbaugh 1981). Age group 1 (3:7-4;6) children in all languages responded appropriately to this type of question. Thai and Lisu Age group 1 (3:7-4;6) children, used the experiential perfect marker, which indicates that they had already acquired the experiential perfect. The experiential perfect has a distinct form in Thai and Lisu, whereas in English the experiential perfect is embedded in the perfect. So we would expect the experiential perfect to be acquired earlier in Thai and Lisu compared to English. There is an example of the English experiential perfect in Age group 2 (4;7-5;6). This would have to be explored further if any conclusions are to be made.

Other aspectual marking

Previous research has shown that even in stage 3 (2;6-3;2) aspect is still centered around perfectives with duration of an event, iterative, habitual and generic all unmarked. English Age group 1 (3:7-4;6) (see Table 11) children used temporal adverbials of number and frequency (habitual, iterative and generic aspect) and duration. In Age group 2 (4;7-5;6), there is slightly more varied usage than Age group 1 (3:7-4;6). However the usage of aspectual adverbials increases with age, and the most diverse usage of aspectual adverbials occurred in

Age group 4 (6;7-7;6). Lisu Age groups 3 and 4, used "everyday" to mark habitual aspect.

5.1.7 Future reference, modals and hypotheticals

Temporal adverbials referring to future events were used by English children of all age groups and "tomorrow" was used by Lisu Age group 2 (4;7-5;6) children.

Harner (1981) found from elicited descriptions of future events in English speaking children of 3;0 to 7;11 years, that even the youngest children (3 years old) used future verb forms over half of the time to code reference to an anticipated event. She also found that the three year olds used present tense more than twice as often as any other age group for past and future events. The future auxiliary used most often was "is going to". The results of this study support this finding. Harner also found that the "intentional" - "will", "wants to" was not used by three year olds and was used only once by four year olds. It was used by 5 to 7 year olds, but not often. "will" is used in this study by English and Thai Age group 2 (4;7-5;6) children, but not by Age group 1 (3:7-4;6) children. Previous research has shown that by the fourth stage children are using the past tense of modals. In the data here, it was found that English Age group 3 (5;7-6;6) children were using "might have" and "might be", "had to" was used in Age group 2 (4;7-5;6). There is also evidence of the use of hypotheticals in Age group 1 (3:7-4;6), "think" was used.

5.1.8 Summary

There seems to be some agreement in the data with previous research. It is difficult to make any strong conclusions with

the shortage of specific data collected using this methodology. A methodology, experimental and/or naturalistic, which collects more detailed information about the specific usage of the different terms of temporal reference is required.

5.2 THE EXPERIMENTAL TASKS

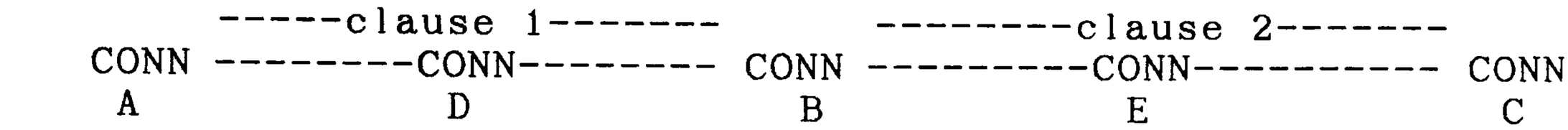
In examining the order of acquisition of the temporal connectives in this study, five main factors have to be taken into consideration; (1) Syntactic factors (2) Semantic/ conceptual factors (3) Language specific semantic range (4) Specific task features, and (5) Pragmatic factors. I will first consider the contribution that Syntactic factors have to the results found in this study. I will then consider the other contributing factors.

5.2.1 (1) PREDICTIONS BASED ON SYNTACTIC ARGUMENTS

Evidence based on cross-linguistic research indicates a special salience for final syllables, clause final particles and sentence final particles (Slobin 1985) -see the Introductory section 1.3.7 (page 58). Selective attention to ends of units and to a less extent the beginnings of units, leaves medial position as the most vulnerable (Clancy 1985). Research has also shown that children are sensitive to the "scope or range" of the particle that operates on the meaning of the clause or sentence (Slobin 1985) - see the Introductory section (page 76). If a particle operates on the whole clause then it should ideally be placed outside of the clause, one should not alter the internal form of the clause. From this it follows that if a particle operates on the whole sentence as temporal connectives do, then it should ideally be placed outside the sentence.

Predictions can be made from this research evidence about the ease of acquisition of the temporal connectives in this study.

The possible positions for connectives in the test sentences are as follows:



Connective A takes initial position in the sentence

Connective B occurs between clauses, at the end of the first clause

Connective C takes sentence final position

Connective D occurs in the middle of the first clause

Connective E occurs in the middle of the second clause

Form the research evidence, I predict that position C should be the easiest for the child, as it is outside and at the end of the sentence. Position B should be the next easiest for the child, as it is outside and at the end of the first clause. Next position A, which is in initial position. Then positions D and E, which have mid-clause or medial clause position, and so should prove the most difficult for the language learner. In order to be able to test these predictions about position of connective in the sentence, we need to look at the position of connective in the different languages and different tasks.

TABLE 31 Predictions about the effect of position of connective in sentence on performance

CONNECTIVE	ENGLISH	THAI	LISU	PREDICTIONS ABOUT SCORES
THEN		mid-sent.	mid-sent.	**No difference in all tasks**
BEFORE	E.I.	mid-sent.	mid-sent.	**No difference**
	Marble+Toy	mid-sent.	mid-clause (1st clause)	**Lisu worst Toy & Marble tasks**
AFTER		initial	mid-sent.	**Lisu best all tasks**
SINCE		initial	mid-sent.	**Lisu best Toy and E.I. tasks**
WHEN		initial	mid-sent.	**Lisu best all tasks**
WHILE		initial	mid-sent. + PAM	?
UNTIL	**Marble**	mid-sent.	final	**Lisu best**
	E.I.+Toy	mid-sent.	mid-sent.	**No difference for E.I. & Toy**
TOGETHER	E.I.	final	final	**No difference**
	Marble & Toy	final	mid-clause (2nd clause)	**Lisu worst for Marble & Toy**

Now I will examine the data (Graphs 2, 5 and 8) to find out if any of these predictions about performance in the tasks are valid.

THEN The prediction was that there would be no difference in performance in the different languages for the connective "then". However in the Marble Task, English is the best and the scores for Lisu and Thai are similar. In the Toy task, English is the best and Lisu is the worst. In the Elicited Imitation (E.I.) task the results follow the prediction and the scores are similar. The results are not similar in the Marble and Toy tasks, so there must be other factors besides syntax affecting

the results.

BEFORE There seems to be an effect of position in sentence for the connective "before", as in the Marble and Toy tasks Lisu has the lowest score compared to Thai or English, (see Graphs 2 and 5), however in the Elicited Imitation task, Lisu also has the lowest score. It seems that non-syntactic factors are also involved.

AFTER In the Marble task, Lisu and English have similar scores, and Thai is markedly lower. In the Toy task, English is the best, then Thai, and Lisu is the lowest. In the E.I. task, English is better than Lisu, which is better than Thai. So for "after" no particular pattern emerges, and the results do not support the prediction that mid-sentence position is easier to acquire than initial position in the sentence.

SINCE In the Toy task the scores are similarly low, but in the E.I. task Thai is a lot lower than English, and Lisu is between these two scores. So no particular pattern emerges. The data does not support the prediction that mid-sentence position is easier than initial position.

WHEN The prediction is that because Lisu has mid-sentence position, it should be superior to Thai or English, which have initial position. But in the Marble task, Thai is the best, and in the Toy and E.I. tasks, English is the best, so the prediction is not supported by the data.

WHILE In the Marble task, Thai and Lisu have similar scores, and English is the best. In the Toy task English is better than Lisu, which is better than Thai, so again no particular pattern emerges.

UNTIL The prediction was that in the Marble task, Lisu should have the highest score, because the connective in Lisu takes sentence final position, whereas in English and Thai it takes mid-sentence position. In Graph 2, we can see that Lisu is slightly better than English, and Thai is the lowest. Examining Age group 1 (3:7-4;6) in Graphs 3A-C, Lisu is the highest. This could be an effect of position of connective in the sentence. Possibly this supports the premise that sentence final position is more salient than mid-sentence position.

However in the Toy task, English is better than Thai, which is better than Lisu, and in the E.I. task Lisu is better than English, which is better than Thai. These results do not support the prediction that performance is similar in all languages, because position in sentence is the same. Therefore these results seem to be due to non-syntactic factors.

TOGETHER In the Marble and Toy tasks, the prediction was that Lisu should have the lowest score, because the connective takes mid-clause position, however unlike the connective "before" the results are not clear cut. In the Marble task, the prediction is followed, and Lisu is the lowest, but in the Toy task, Thai is the lowest, then Lisu, and then English. Possibly the mid-clause effect on "together" is not as strong as on "before", because "together" is a term which is acquired early meaning "to do some action with someone" as well as its temporal function meaning "at the same time". Also in Lisu "before" occurs in the middle of the first clause, whereas "together" occurs in the middle of the second clause, perhaps this has an effect on ease of acquisition.

In the E.I. task, it was predicted that because connective position is the same then the scores would be similar, but in fact English is a lot better than Thai or Lisu, so again non-syntactic factors are at work.

In summary the findings are that overall, there is not a strong effect on performance of position of connective in sentence. There does seem to be an effect from the medial clause position of "before" in Lisu in the Toy and Marble tasks. For "together", which also has medial clause position in the Marble and Toy tasks, the effect is not strong. Possibly the medial clause position does not affect this connective as much as "before" because it is generally acquired early by children. There is also a possible effect of final position in sentence being more salient than mid-sentence position for "until" in the Marble task, but this could be due to non-syntactic factors. The other prediction that mid-sentence position of connective is easier than initial position is not supported by the data. Also the prediction that connectives with the same position in sentence have similar scores is not supported either. This suggests that non-syntactic factors are at play. So it seems that the effect of syntax on language acquisition in the children of this study, aged three and a half years to seven and a half years is not strong. Perhaps younger language learners would be affected more by these syntactic factors. In conclusion, syntactic factors can largely be ruled out when explaining the language differences in temporal connective scores in these tasks. Other factors have to be considered instead, ie. semantic, task related and other language specific

factors. Now I want to look at the Semantic arguments for interpreting the data.

5.2.2 (2) PREDICTIONS BASED ON SEMANTIC ARGUMENTS

The general language predictions based on semantic arguments have already been described and outlined in the section on pages 67-71 (see Table 5, page 71 for a Summary of these predictions), these are listed and tested on the three languages of this study in Table 32 below. I first look at these general language predictions, and I only examine semantic, language specific explanations if the results do not conform to these predictions. The reason for this strategy is because there are a lot of language specific variables in this type of cross-linguistic study, so by examining only the results that do not conform to the general language predictions, the task is simplified.

The results in Table 32 are taken from Graphs 2, 5 and 8.

TABLE 32 Predictions based on Semantic arguments

TASKS	LISU			THAI			ENGLISH		
	M	T	EI	M	T	EI	M	T	EI
(1)**together** has high score	Y	Y	-	Y	Y	-	Y	Y	-
(2)**then** has a high score	Y	Y	Y	Y	Y	Y	Y	Y	Y
(3)**sequence > simultaneity**	Y	X	X	X	Y	X	Y	Y	X
(4)**then > after**	X	Y	Y	Y	Y	Y	X	Y	X
(5)**then > before**	Y	Y	Y	X	X	X	X	Y	X
(6)**before > after**	X	X	X	Y	Y	Y	X	X	X
(7)**when > before/after**	X	X	X	X	X	X	X	X	X
(8)**when=while=at the same time**	X	Y	X	X	X	X	X	X	Y
(9)**since** score is low	-	Y	Y	-	Y	Y	-	Y	Y
(10)**until** score is low	X	X	X	Y	X	Y	X	X	X
(11)**since = until**	-	X	X	-	X	Y	-	X	X

(Y = yes the prediction is supported, X = no the prediction is not supported, - = connective not used in this task, M = Marble task, T = Toy task, EI = Elicited imitation task, > means "is acquired prior to", = means "is acquired at the same time".}

The results in Table 32 are discussed in detail below.

(1) **together** has a relatively high score in all languages in the Marble and Toy tasks (see Graphs 2, 5 and 8). It appears to be relatively easy to acquire as was expected.

(2) **then** has a relatively high score in all languages and all tasks, so it appears to be acquired with relative ease (see Graphs 2, 5 and 8).

(3) **Sequence is acquired before Simultaneity**

In Lisu for the overall scores in the Marble task, the prediction is followed (Graph 2). Examining Graph 3A for the different age groups, we find for all age groups except Age

group 2 (4;7-5;6) ("before" is low), that sequential connective scores are higher than simultaneous connective scores. The low score for "before" in Age group 2 (4;7-5;6} is probably due to syntactic factors; "before" in Lisu takes medial clause position. In the Toy task the results do not support the prediction, the scores for sequence and simultaneity are similar.

In Thai, in the Marble task (Graph 2) the results are mixed; "before" > "when" > "after > "while". Examining Graph 3B, in Age group 1 (3:7-4;6) "when" is the highest, but in Age group 3 (5;7-6;6) performance is retarded. "after" in Age groups 2 and 3 is especially low. In the Toy task, the prediction that sequence is higher than simultaneity, is supported. "when" and "while" have particularly low scores in this task. In the E.I. task, the results are again mixed; "before > "together/at the same time" >"when" > "after" ="while". "after" is noticeably low in the Marble and E.I. tasks.

In English in the Marble task, the results follow the prediction that sequence emerges prior to simultaneity, but in the Toy task "when" is lower than the other connectives. In the E.I. task "when" again is slightly retarded compared with the other connectives.

(4) **"then" has a higher score than "after"**

In Lisu in the Toy and E.I. tasks, "then" has a higher score than "after", and in the Marble task there is no difference in the scores. In Thai "then" is higher than "after" in all tasks. In English, in the Toy task "then" is higher than "after", but in the Marble and E.I. tasks the scores are

similar. In Thai the prediction is supported, but in Lisu and English the results are ambiguous.

(5) **"then" has a higher score than "before"**

In Lisu "then" as expected is higher than "before" in all tasks. In Thai the scores are similar for all tasks. In the English Marble and E.I. tasks, the scores are similar, while in the Toy task "then" is higher than "before". The results show that we have language specific differences and task specific differences.

(6) **"before" has a higher score than "after"**

Overall it is only the Thai data that supports the prediction that "before" is easier than "after". The Lisu and English data do not support this. In fact for Lisu, this trend is reversed and the score for "after" is higher than the score for "before" in all tasks. This is probably partially due to syntactic factors; "before" in the Marble and Toy tasks takes medial position. For English Marble and E.I. tasks, the scores for "after" and "before" are similar, and for the Toy task "after" is greater than "before". Again the results are not conclusive.

(7) **"when" has a higher score than "before" or "after"**

The results do not support this premise. In the Lisu Marble task, "when" is lower than either "after" or "before". In the Toy task the scores are similar, and in the E.I. task "after" is higher than "when", which is higher than "before".

In the Thai Marble and E.I. tasks, "before" is higher than "when" which is higher than "after". In the Toy task "when" is a lot lower than either "after" or "before".

In the English Marble and E.I. tasks, "when" is lower than either "before" or "after", and in the Toy task the scores are similar.

(8) The scores for "when", "while and "at the same time" are similar

The prediction was that as these connectives have the same function ie. to indicate simultaneity of two events, then they should be acquired at about the same time, and have similar scores. However the results do not fully support this, see Table 33 below.

Table 33(a) The scores of the simultaneous connectives compared across tasks and languages (PAM=progressive aspect marker).

	MARBLE	TOY	E.I.
LISU	when>when+PAM	when=when+PAM	when>when+PAM>together
THAI	when>while	while>when	when=together>while
ENGLISH	while>when	while>when	while=together=when+PAM>when

Table 33(b) and across Age groups.

	MARBLE	TOY	E.I.
LISU			
AGE GROUP 1	when>when+PAM	when>when+PAM	when>when+PAM>together
AGE GROUP 2	when>when+PAM	when>PAM>when	when>when+PAM>together
AGE GROUP 3	when>when+PAM	when+PAM>when	when>when+PAM
AGE GROUP 4	-	when+PAM>when	-
THAI			
AGE GROUP 1	when>while	while>when	when>together>while
AGE GROUP 2	when>while	while>when	when>together>while
AGE GROUP 3	when>while	while>when	when>together>while
AGE GROUP 4	when>while	while>when	when>together>while
ENGLISH			
AGE GROUP 1	when>while	while>when	while>when>together
AGE GROUP 2	while>when	while>when	similar
AGE GROUP 3	while>when	while>when	together>while>when
AGE GROUP 4	while=when	while>when	together>while>when

(AGE GROUP 1 - 3;7-4;6 years, AGE GROUP 2 - 4;7-5;6 years,
AGE GROUP 3 - 5;7-6;6 years AGE GROUP 4 - 6;7-7;6 years.)

In the Lisu Marble task, we find that "when" has a higher score than "while" ("when"+PAM) and this trend is reflected in Age groups 1, 2 and 3. In the Toy task the scores are similar. Examining Graph 6A for the Toy task, we find that Lisu Age group 1 (3;7-4;6) follows this trend, but that in all other age groups "while" ("when"+PAM) is greater than "when". It seems that PAM facilitates the interpretation of "when" as simultaneous in Age group 2 (4;7-5;6) and older in the Toy task. In the E.I. task we find that "when" is greater than "while" ("when"+PAM) which is greater than "together". In this task the interpretation of the connective "when" is not facilitated by PAM (progressive aspect marker). "together/at the same time" is the most difficult simultaneous connective for Lisu.

In the Thai Marble task, we find that "when" is higher than "while" overall and for all age groups, but in the Toy task "while" is greater than "when" overall and in all age groups. Task difference needs to be examined to explain these different results. Examining Appendix 25.1 for errors in interpretation of "when" in the Toy task, we find that "when" is frequently interpreted as sequential, this increases with age. In Age group 4 (6;7-7;6), 56/60 responses are sequential. This strong interpretation of "when" as sequential was also reflected in the Adult group tested. There are also quite a lot of sequential responses for "while", with maximum sequential responses occurring again in Age group 4 (6;7-7;6). I will examine task sentence differences and the effect on "when" and "while" later. In the E.I. task "when" and "together/at the same time" have similar scores and are both higher than the score for "while".

"while" seems to be a particular problem for Thai children in this E.I. task. This again indicates a task difference in interpretation of the simultaneous connectives.

In the English Marble task, the overall score for "while" is higher than the score for "when". If we examine Graph 3C for the different age group scores, we find that for Age group 1 (3:7-4;6), "when" is greater than "while", but for Age group 2 (4;7-5;6) "while" is greater than "when". In the Toy task, "while" is greater than "when" for all age groups. In the E.I. task, the scores are similar for "while" and "at the same time", with the score for "when" lower. However "when" with PAM (progressive aspect marker) has a similar score to "while" and "at the same time" (see Table 28 in the Results Chapter).

In summary the prediction that the connectives indicating simultaneity have similar scores and are acquired at the same time, because they have a similar function is not supported by this data. The underlying function of these connectives is not identical between and within languages, they cannot be mapped directly onto each other. I need to examine in more detail how these connectives operate in the different sentential environments in the different experimental tasks used in this study.

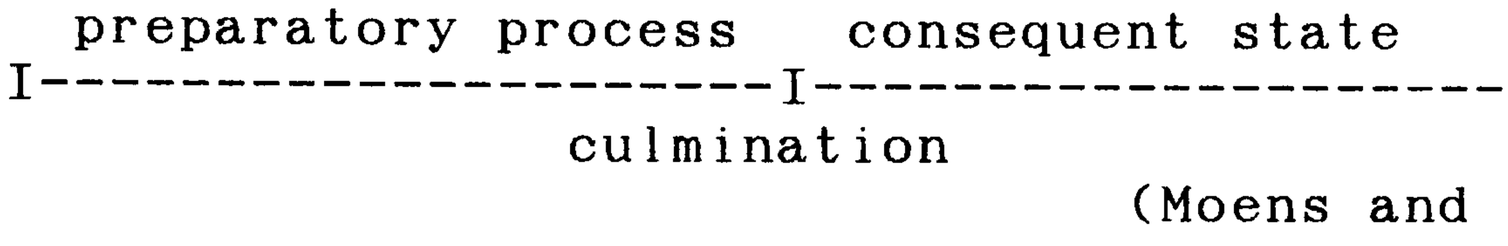
5.2.3 (3) Language Specific Semantic Range

(a) The effect of aspect on temporal connective

According to Moens and Steedman, the function of "when" within the subordinate clause is to map any kind of event into a culminated process (Moens and Steedman 1986). When confronted

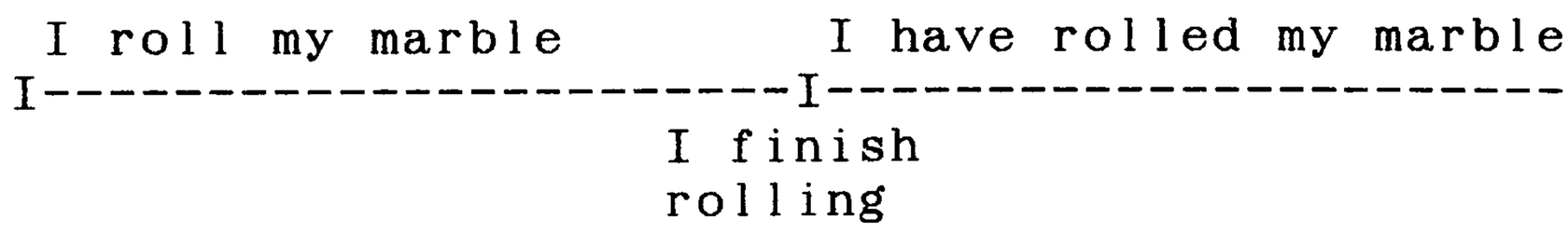
with a "when"-clause, the hearer will try to interpret it as describing a complete nucleus (see Diagram 9). This then functions as the temporal referent to which the main clause has to be evaluated. In practice this means that the main clause event is to be situated somewhere within the nucleus described by the "when"-clause. World knowledge will help specify the exact location of the main clause event.

Diagram 9 A complete nucleus is characterised as follows:



(Moens and Steedman 1986)

In the Marble task, two Process expressions are combined, eg. "When I roll my marble, you roll your marble". When "when" is combined with a Process expression, the expression will be given more structure, so that it has a culmination ascribed to it. So that the subordinate clause or the action performed by the Experimenter can be represented pictorially as:



The main clause, ie. "you roll your marble" can be situated anywhere along this nucleus. In this example if the preparatory process phase of the nucleus is the focus, then a "while" type response will be given. If the focus is on the inception of the event of throwing, then the simultaneous occurrence of two events will be recorded, which is recorded as the correct "when" response in this task. If the culmination or consequent state of the event is focussed on by the Subject, then a sequential

response will be given.

The focus with "while" is on the preparatory process part of the nucleus, ie. "during the time that",

eg. "While I roll my marble, you roll your marble"

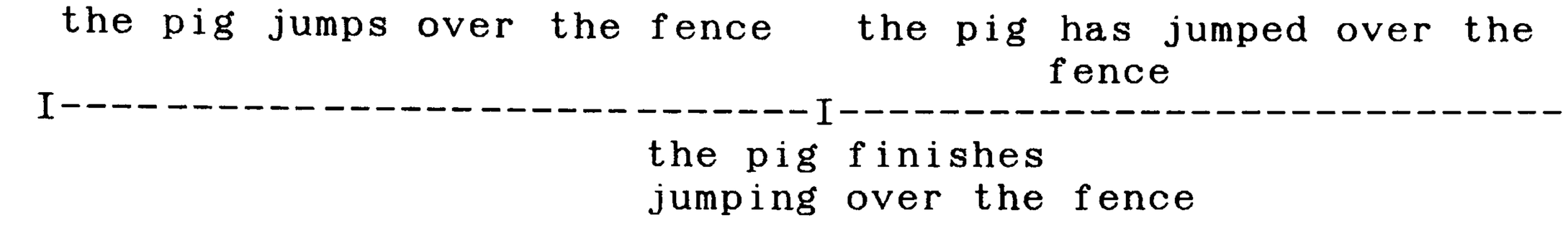
and the response should occur "during the time of rolling". If the focus is on the inception of the event, then a "when" type response would be given. If the focus is on the culmination or consequent state part of the nucleus, then a sequential response would be given.

Examining the error data for the connectives "when" and "while" in the Marble task (Appendix 24.1 and 24.2), we can see that in Lisu, English and Thai, Age group 1 (3;7-4;6) children make the most sequential responses. This decreases with age in all languages, with only a few sequential responses in Age group 4. We find similarly for "while" in all languages, that sequential responses are most common in the youngest Age groups; Age group 1 (3;7-4;6) and 2 (4;7-5;6), this decreases with age, with few sequential errors in Age group 4 (6;7-7;6). "while" is responded to with the maximum of "when" type responses in Lisu and English Age group 3 (5;7-6;6), and Thai Age group 1 (3;7-4;6). In all languages, Age group 4 (6;7-7;6) has the least "when" type responses.

In the Toy task, "when" sentences consist of two culminated process expressions. According to Moens and Steedman a "when" clause containing a culminated process does not have its temporal referent changed.

eg. In the sentence "When the pig jumps over the fence, the dog jumps over the fence" the subordinate clause is represented

pictorially as:



The main clause "the dog jumps over the fence" is situated anywhere in this nucleus. In this case, if the focus is on the inception of the event a simultaneous response would be given by the Subject, which is recorded as the correct "when" response in this task. If the preparatory process is focussed on in the subordinate clause by the Subject, then the two events would overlap in time. If the culmination or consequent state is focussed on then a sequential response would be given. World knowledge does not make it clear which part of the nucleus of "jumping over the fence", the main clause culminated process expression ie. "the dog jumps over the fence" should be a part of.

Examining Appendix 25.1 for the Toy task, we can see that maximum sequential responses were given to "when" sentences in Lisu and English, Age group 3 (5;7-6;6) with less sequential responses made in Age group 4 (6;7-7;6). The Thai data in particular, shows a large number of sequential responses to "when" sentences, which also increases with age, with 56/60 sequential responses in Age group 4 (6;7-7;6). It seems that "when" with culminated process expressions in Thai, gives a strong focus on the culmination or consequent state part of the nucleus, so as to be interpreted as for example like; "When the pig has jumped over the fence, the dog jumps over the fence". It gives a perfective reading to the "when"-clause. The

sequential responses to "while" in Thai also reflects this pattern, with maximum sequential response in Age group 4.

"while" sentences in this task, consist of either the same type of sentences as the "when" sentences - Type A - two culminated process expressions, or sentences consisting of a culminated process and a process or vice versa combination,

eg. "While the dog jumps over the fence, the hen jumps over the fence"-Type A,

eg."While the dog jumps over the fence, the hen sleeps"-Type B, or "While the hen sleeps, the dog jumps over the fence"-Type C. In all types of sentences the function of "while" is to focus on the preparatory process of the subordinate clause event. It was found in Thai and Lisu, that the most number of errors were made to Type A sentences (the combination of two culminated process expressions), the next highest errors were made to Type B sentences (the Culminated Process expression followed by the Process expression) and the least errors to Type C sentences (the Process expression is followed by the Culminated Process expression) see Appendix 25.2. In English there were fewer errors than in Thai or Lisu. Most errors in English were made to Type A and Type B sentences, both have a Culminated Process expression in the "while"-clause. In all languages, it was found that the least number of errors was made to Type C sentences (the Process is followed by the Culminated Process expression). This type of sentence is compatible with the function of "while". The Process expression in the "while"-clause facilitates the interpretation of "while" as simultaneous in all languages. A Process expression (imperfective) in the

subordinate clause is compatible with a simultaneous connective, whereas a Culminated Process expression (Perfective) is ambiguous in interpretation. It is interesting that in Thai and Lisu that the aspect of the main clause also affects the results. It appears that a Process expression, even in the main clause facilitates the interpretation of "while". The sequential response was made most to the Type A sentence, and then to the Type B sentences, and least to Type C sentences see Appendix 25.1. In English the interpretation of "while" as sequential is low. It appears that "while" in English has a strong link with the preparatory process phase of the subordinate clause event, and consequently a strong interpretation as simultaneous, even with a Perfective expression in the first clause. This is the reason why the score for "while" in English has an elevated score in the Toy task compared with Thai or Lisu (see Table 22 in Results Chapter). Whereas the simultaneous connectives "while" and "when" in Thai, seem to be particularly sensitive to the inherent aspect of the sentence. This is the explanation why the score for "when" in Thai is significantly lower than English or Lisu in the Toy task (see Table 22 in the Results Chapter).

In the Marble task, the correct "when" and "while" responses are not identical. For the "when" response, the task requires that the inception of the event is focussed on, and the response is acted out so that it occurs simultaneously with the action of the Experimenter. The "while" response requires the child to focus on the duration or preparatory process phase of the experimenter's action and to act out the response at some

point during that phase. Whereas in the Toy task the correct "when" and "while" acting-out responses appear identical for Type A sentences (two Culminated Process expressions) - the two toy animals are moved at the same time. This could be due to the demands of the task, which require the child to act-out two actions. It would be physically difficult for the child to move one animal, and while that animal is moving to move the other animal. In the response to the "while" sentences, the child appears to focus on the inception of the Culminated Process nucleus in the subordinate clause, and acts out the two actions at the same time. If the subordinate clause contains a Process expression (Sentence Type C), then the focus is on the preparatory phase and the child acts out this action, and while this action is in progress, he/she acts out the main clause action. The focus in the Process expression is unambiguous, whereas with the Culminated Process expression the focus is ambiguous; the main clause action could occur at the inception, during the preparatory process, at the culmination or during the consequent state part of the nucleus.

In the E.I. task, the "when" sentences consist of either culminations, culminated processes or processes (see Appendix 26). The interpretation of verbal expressions into these categories, is flexible between languages, and even within languages, eg. a plural or the interpretation of the Object noun can affect the category. The "when" sentences used in this task were;

eg, "When the girl throws the stones, the boy plays the guitar"

-two Process expressions (no plural used in Thai or Lisu so

could be interpreted as a Process or a Culminated Process), eg. "When the girl makes the food, the boy cuts the wood"

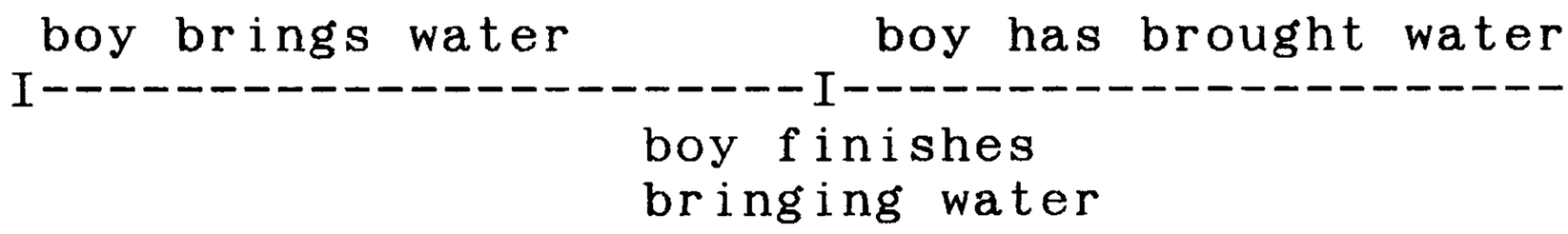
-two Process or Culminated Process expressions depending on how the Object noun is interpreted,

eg. "When the boy washes the plates, the girl sweeps the floor"

-two Culminated Processes/Processes

eg. "When the boy brings the water, the girl lights the fire"

-two Culminated Processes. The subordinate clause in this sentence can be represented pictorially as;



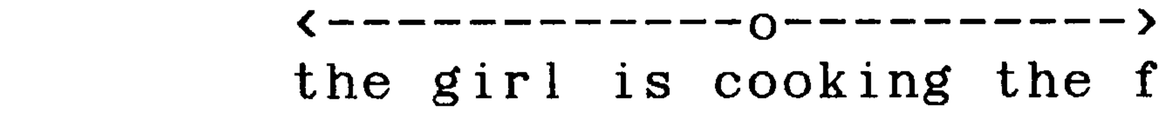
The main clause "the girl lights the fire" occurs somewhere in this nucleus, the interpretation depends on knowledge of the world. The interpretation is ambiguous. It can be interpreted simultaneously or sequentially, depending on which part of the nucleus is focussed on.

Also in the E.I. task the progressive is used, which causes these events to be turned into progressive states. As previously stated in the Introductory Section (p32-33), a progressive auxiliary can only combine with a Process expression. If the expression is not a Process eg. a Culminated Process expression, then it has to be turned into a Process first. This means that the associated goal or culmination point is not described anymore. It is the preparatory process leading up to the culmination point that is said to be in progress, with no implication that it is actually reached, ie. the progressive describes the process part of the nucleus as in progress.

According to Moens and Steedman, "when" combined with a

stative main clause expression, acts as a kind of background against which the "when"-clause is to be situated. This holds for ordinary stative expressions as well as for consequent, progressive and habitual states. No causal link is established between the two events. Since it is characteristic of states that they are identical at every point at which they hold, they can be represented as a punctual entity (see the diagram below); the arrows indicate that the state (probably) extends forwards and backwards in time.

eg. "**When** the boy is sweeping the floor, the girl is cooking the food".



This stative point can be placed anywhere along the nucleus described in the "when"-clause. In this case the subordinate clause contains a progressive stative too, ie. "the boy is sweeping the floor", so that the two statives coincide in this "when"-sentence.

The interpretation of "while" is less ambiguous than "when", The focus is on the preparatory process of the subordinate clause, and the event in the main clause occurs at some time during this phase. "while" makes the subordinate clause into a progressive state by focussing on the duration or preparatory phase of the event,

eg. "**While** the girl plays the guitar, the boy makes a boat".

The Process expression in the subordinate clause in this example, is turned into a stative expression by "while". It does not matter what type of expression is used in the subordinate clause, ie. a culmination, a culminated process or a process,

the effect of "while" is to give the subordinate clause a stative reading in English ie.,

the girl is playing the guitar
<----------o---------->

The main clause, "the boy makes a boat" can occur anywhere along these arrows. If the subordinate clause already has a stative reading, eg. by use of the Progressive, then there is no change in the reading, the stative reading due to "while" is merely reinforced. In English the use of the progressive facilitates the interpretation of "when", but in Thai and Lisu, the progressive has an adverse effect. Possibly in Thai and Lisu, "when" without the progressive has a conceptually easier sequential interpretation, but with the progressive this gives a simultaneous reading, which is conceptually more complex especially when combined with perfective expressions. In English, it seems the ambiguity of interpretation of the "when" sentence as sequential or simultaneous, ie the focus in the nucleus, is reduced by use of the progressive. The data shows that "when" and "while" in different languages, have a different interpretation or focus, which is affected to a greater or lesser extent by the aspectual environment of the clause or sentence.

Possibly the increasing number of sequential responses with age to the connective "when" with punctual aspect as in the Toy task sentences (Appendix 25.1), reflects a developmental shift in usage of closely related forms, such as described by Silva's paper on the use of the co-temporals "when", "while" and "as" in English children's narrative (Silva 1991). She found that although "when" may occur with a variety of aspects in the

subordinate clause, adults overwhelmingly selected punctual predicates with this particle. Children also favoured punctual aspect with "when", but to a much lesser degree than did the adults. Children use durative predicates with "when" clauses because the particles "while" and "as", which requires duration, were not so accessible to them. It seems that as speakers acquire facility with the durative conjunctions, the entire co-temporal system undergoes a reorganization. After such acquisition, "when" is reserved for primarily punctual function, even though its co-occurrence with other predicate types remains grammatical. "While" and "as" take on the work previously accomplished by "when".

"since" and "until"

The prediction that "since" scores are low, seems to be supported by the data across languages in the Toy and E.I. tasks, but the prediction that "until" scores are low, is not supported across the board by the data. "until" in the Marble task is not difficult for Lisu or English children, even though it has a negative and the order of mention of events is reversed, but in Thai it is difficult for all age groups. "until" in the Toy task is not a problem for English, Thai or Lisu children. In the E.I. task "until" is not a problem for Lisu or English children, but for Thai children the score is low. In comparing the scores for "until" and "since", we find that "until" scores are higher than "since" scores for English and Lisu in the Toy and E.I. tasks, and for Thai in the Toy task. However for Thai in the E.I. task, the scores are similar. This is due to the retarded score of "until". This is a language specific effect and a task specific effect. It seems overall that "since" is conceptually more difficult for children than "until".

In the Toy task the "since" and "until" sentences have the following form; either a Process expression followed by a Culminated Process expression or a Culminated Process followed by a Process expression, eg.,

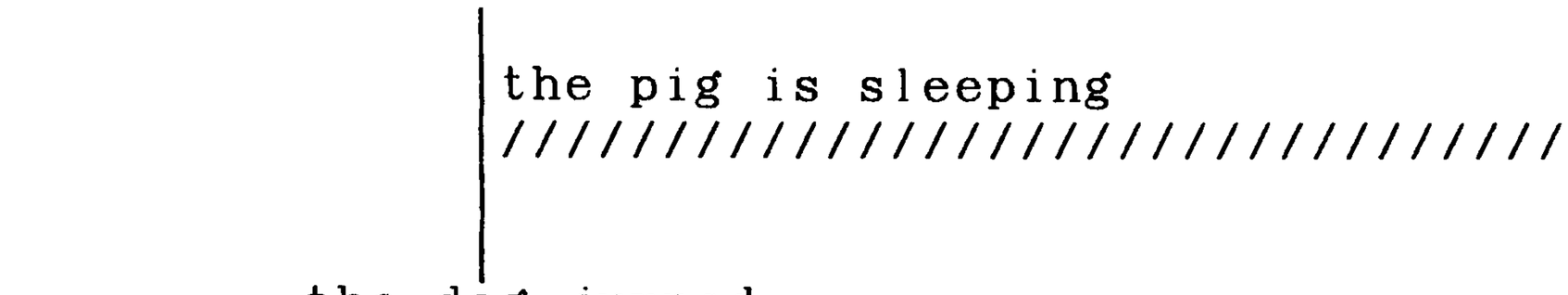
A. "Since the dog jumped over the fence, the pig has been sleeping".

B. "Since the pig has been sleeping, the dog has been jumping over the fence", or

C. "The pig sleeps until the dog jumps over the fence".

D. "The dog jumps over the fence until the pig sleeps".

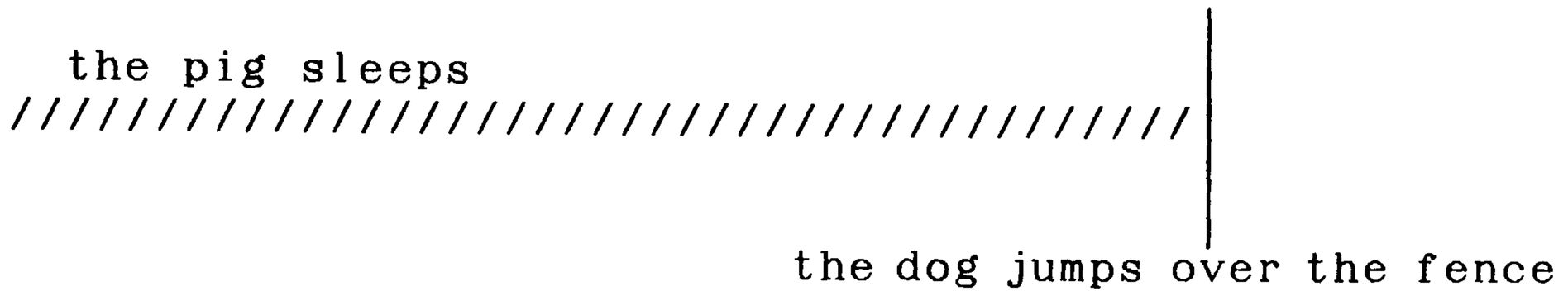
In English "since" sentences, quite complex tense and aspect forms have to be used. A "since" sentence is characterised pictorially as (Sentence A);



"since" causes the main clause to be given a progressive state reading, also "since" requires the subordinate clause to have a culmination. In Sentence B for English. because a process is used in the subordinate clause, which lacks structure, a structure is ascribed to it by use of the perfect progressive. "since" causes the focus to be on the inception of the event. One would expect Sentence A to be easier than Sentence B, because the structure of the sentence matches the prescribed structure for a "since" sentence, but conversely a common error in all languages was to make many errors to Sentence type A compared to Sentence type B (see Appendix 25.3). The typical response was to act out the process expression "the pig sleeping" prior to the culminated process expression, "the dog jumps over the fence" (see Appendix 25.4). The number of these type of errors reaches a maximum in Lisu and English Age group 4 (6;7-7;6) and Thai Age group 3 (5;7-6;6). From this error type, it seems that the child's primary focus is on the "duration" component with neglect of the "order" component of the "since" sentence. The same effect was not found for "until".

"until" is the mirror image of "since". The following sentence; "The pig sleeps until the dog jumps over the fence"

(Sentence C) can be represented pictorially as;



"until" causes the main clause to become a progressive state. It also requires that the subordinate clause has a perfective reading. In Sentence D, "the dog jumps over the fence" takes on an iterative reading, and the process expression in the main clause becomes more structured. The focus is on the inception, ie. "the act of going to sleep". One would expect Sentence C to be easier than Sentence D, because the order and the aspectual structure of the sentence matches the prescribed structure of an "until" sentence. In Lisu, this expectation is followed, but for Thai and English the reverse is true (see Appendix 25.5). The difference between sentence types is not as marked as for "since".

In Thai, it was found that "until" has a low score in the Marble and E.I. tasks, but not in the Toy task. In the Marble and E.I. tasks perfective expressions are used (the use of the negative "don't" in the Marble task gives a perfective reading to the subordinate clause), whereas in the Toy task, an imperfective process expression is used, possibly this assists in the interpretation of "until" in these sentences in Thai.

(b) Semantic range of the Temporal Terms used in the different languages

The effect of the aspect of the test sentences on temporal

connectives used in the different tasks has already been considered. I would now like to consider other semantic, language specific effects.

As Bowerman (1981) has stated it is important to consider the fact that the surface forms for a similar concept in different languages are not translative-equivalents. It is important to examine the semantic range these different connectives have in the different languages. Crosslinguistic research should take account of this variation in semantic structure. It is important to attempt to look at how these forms together with other closely related forms, divide up the domain of meaning over which they operate into contrasting categories (Bowerman 1981).

In English the connective "together" is used to signify two actors doing an action simultaneously, whereas in Thai and Lisu the form used for "together" can be used for this function as well as to signify two actors doing two different actions simultaneously (in English another simultaneous connective, such as "at the same time", "while" or "when" has to be used for this function). From the prediction that unifunctional terms are easier for children to acquire than plurifunctional terms (see page 60 for a discussion of this), (Slobin 1973, 1985), then it follows that the English "together" should be acquired with greater ease than either the Lisu or Thai form. From Table 30 (Results chapter) English has the highest score, so this could be a contributing factor. Similarly "at the same time" (as used in the E.I. task) in English is used for one function, ie. to signify two actors doing two actions simultaneously, whereas the

form used in Thai or Lisu has two functions, so from this one would expect that in the E.I. task English performance is the best. The results agree with this prediction, so possibly this is an additional influence on the results in this study.

In Lisu there are several forms that can be used to express the function of "then". In Lisu and Thai the connective to express a "then" function can also be omitted altogether and either assumed or expressed using series of verbs. In English there is one form for one function, ie. "then" or "and then". From this one would predict that the expression of "then" in English would be relatively easy to acquire. Examining the results in Table 30 we find conflicting results. In the Marble and Toy tasks, English has the highest score, but in the E.I. task there is no significant difference. This could be due to task specific effects.

In Lisu, in this study the form "bia" is used to represent the function of "until"), it can also be used to represent a "then" function. From the plurifunctional nature of this connective we might predict that this form would be more difficult to acquire than the unifunctional form of English. In Thai "theung", the form used for "until" has other functions too. This could contribute to the results found in Table 30.

The interpretation of the aspect of a clause or sentence of a 'translative-equivalent' form, can also vary between languages, and so affect the data. For example in the Marble task "roll a marble" could have a different aspectual interpretation in the different languages, ie. it could have a more punctual rather than a durative interpretation. This could

account for the results in the Marble task (Appendix 24.1), where in Lisu there is a strong sequential response to "when" sentences, possibly "roll a marble" in Lisu has a strong punctual interpretation, which affects the interpretation of the connective "when".

The semantic space that 'translative-equivalent' terms operate in, needs to be examined further. In order to collect more specific information on how related temporal connectives divide up a given semantic domain, naturalistic (Reilly 1990) or elicited narrative (Silva 1991) methodologies would need to be incorporated.

5.2.4 (4) The effect of the Task on the Results

It is important to look at why there is rather little concordance between the results in the different tasks. The effect of the sentential aspect of the test sentences on temporal connectives and the semantic variation in 'translative-equivalents' used in the different tasks, has already been considered. I would now like to consider the effect that the task could have on the results obtained. Different demands are made on the child by the different tasks, which obviously affects the results.

Both the Marble task and the Toy task look at comprehension of temporal connectives through an acting-out procedure. The Marble task is a simpler task, the child has to remember and act out only one clause. The Toy task is a more complex task, the child has to remember two events, order the two events, and subsequently act them out, so there is increased complexity of

task and memory load in the Toy task compared with the Marble task. Also in the Toy task the objects have to do the actions rather than the child and the experimenter, as in the Marble task.

Stevenson and Pollitt (1987), found that performance with their simplified command sentence:

eg. 'Move the blue car before the train stops',

which are similar to the sentences in the Marble task, was superior to performance with sentences like those of Clark (1971), that are similar to the Toy task. They found that when memory load was reduced so that just one of the two events had to be acted out (as in the Marble task) there was an increase in correct response. Similarly in this study, it was found that children generally scored higher on the Marble task than on the Toy task.

It was found that it was easier to record simultaneous responses in the Toy task than the Marble task, due to the nature of the tasks; the responses to the Toy task took longer to act out. However this difference is not reflected in the data.

Below I have summarised the differences between the Marble and Toy tasks.

1. In the Marble task the child has to act out one event only, whereas in the Toy task the child has to act out two events, so the Marble task is less complex and has less memory load.

2. In the Toy task the action is self initiated, whereas in the Marble task, the child is required to throw after the count of three,

3. Aspect of Sentence - In the Marble task Process expressions are used, whereas in the Toy task Culminated process and some Process expressions (for the connectives "while", "until", "since" and "together") are used.

4. Recording of Result - in particular it was easier to record simultaneous responses in the Toy task.

In the Elicited imitation task, the child is required to memorise, process and then produce the two clauses in the test sentences. It is primarily a production task. As in the Toy task, children are expected to memorise two clauses.

Examining Table 30 for possible task specific effects. "then" in English has the highest score both in the Marble and Toy tasks, but not the E.I. task. In the Toy task there is no significant difference for "since", but in the E.I. task English performance is better than Thai. Differences between the characteristics of the tasks used, could account for some of these differences. It is difficult to account for the differences in results recorded in Table 30, in terms of specific task features. There is not a consistent pattern.

Tager-Flusberg et al (1982) advocate the use of diverse tasks (see Methodology, page 111) to reduce the problems and limitations inherent in assessing performance. The advantage of multiple methods is that when there is an overlap in the data from several experiments this increases confidence in the results obtained. However when there is not an overlap in the data, there are problems in explaining the results, especially in a cross-linguistic study such as this one, where additional task variables have a confounding effect on the results. Clearly

more in-depth research is required to investigate the task differences found in this study, and to attempt to reduce the number of variables affecting the results. In my opinion the multiple methodology has advantages, in that it gives a broader, even if more complex view of language development. However this type of methodology needs to be very carefully planned, in order to control the number of variables affecting the results as much as possible.

5.2.5 (5) The Contribution of Pragmatic Factors to the Results

The contribution that pragmatics has on language acquisition has often been ignored, probably mainly due to the fact that it is hard to evaluate. As the child acquires knowledge of the formal aspects of language he/she is also learning how to use language in the appropriate contexts. I would like to consider the possible contributing role that pragmatics may have had on the results in this study.

Work by Ochs (1985, 1989), Clancy (1986), Eisenberg (1985), and Schieffelin (1979, 1981, 1985) have indicated that among the various constraints affecting children's linguistic competence, social and cultural systems play an important role. Based on the fact that the physical environment of Lisu children is least like that of English children, and that Lisu children are least familiar with the types of tasks used, one would expect Lisu children to have the lowest performance scores in the tasks of this study. However the results do not conform to this expectation (see Table 30). In fact Thai children generally seem to have the lowest scores. This could be due to the role and

expectations of Thai children in Thai society.

Familiarity with the form used in the tasks and actual usage of this form by the community of study could affect the results too. Platt (1986) on the acquisition of Samoan deictic verbs found that the semantically less complex 'sau', 'come' was produced later and less frequently than the more complex verb 'aumai', 'bring/give', by Samoan children aged two to four. While this pattern is the reverse of what a semantic account might predict and the reverse of the acquisition order for English speaking children (Clark 1978), it is compatible with expectations concerning appropriate behaviour between persons of different social rank, in this case between children and their caretakers. This research suggests that children's production is guided not only by conceptual simplicity and perceptual ease but by social appropriateness too. Similarly the ergative case marker in Samoan is not salient to the young language learner because it is not frequent in their particular register to which they are exposed most often (Ochs 1985). Research has also suggested that rate differences related to input do exist (Newport et al 1977). Cross (1978) reports that acceleration in linguistic acquisition is associated with an input that is substantially matched to the child's own communicative intentions. Newport et al (1975) found evidence that the frequencies of certain kinds of structures in maternal speech do predict learning of related structures by the child, although frequency interacts with children's language processing strategies to produce patterns of outcome not predictable from absolute frequencies alone. Only certain aspect of language

development are affected by frequency differences in the input. Universals such as the expression of semantic relations among agents, actions, objects, locations and so on are least affected, whereas language specific structures like the English auxiliary system are most affected (Newport et al 1977). The appropriate usage, frequency of usage and familiarity with the forms used in the tasks, could all affect the results obtained in this research.

There are so many variables at play in a study like this, that it is difficult to account for the results in terms of specific, single factor explanations.

5.2.6 The Effect of Aspect on Performance of Temporal Connectives

The possible influence of aspect on the child's acquisition of temporal reference was also explored. In conjunction with a temporal connective, the English progressive is often used to signal simultaneity between two events, whereas the past may be used to indicate completion.

In the E.I. task the following 5 connectives were tested with and without progressive aspect markers in all three languages; sequence - "then", "before", "after", sequence or simultaneity can be indicated by "when", and simultaneity - "together/at the same time". In English the two tenses used were either the present tense or the present progressive. The interaction between temporal connective and progressive aspect was examined.

Keller-Cohen (1981) predicted that aspect would not affect

a child's interpretation of temporal connective until about 5 years of age in English children. Keller-Cohen thought that at this age the acquisition of the progressive might aid a child in interpreting sentences describing simultaneity, since the child would have begun to be sensitive to both the verb form and the temporal connective. According to Keller-Cohen, children of about 5 years of age, Age group 2 (4;7-5;6) in this study should perform better on imitation tasks describing simultaneity (ie. "when" and "together/at the same time" that included progressive aspect markers). Sentences in English with verbs in the progressive are expected to elicit better performance on simultaneity than those with verbs not in the progressive.

In the English data (see Table 28), we find that "when" is facilitated by the use of the progressive in all age groups, except Age group 1 (3;7-4;6), and so follows Keller-Cohen's prediction. Whereas "together/at the same time" is not, in fact the progressive has a negative effect on performance. The facilitating effect of the progressive on "when" in English, is not reflected in the Thai or Lisu data. In Lisu and Thai the progressive has a negative effect on performance of "when" (see Graph 12). The progressive generally has a negative effect on performance of connectives in all languages, with "when" in English the exception. The negative effect of progressive aspect on the score of connective is most apparent in the Thai results (see Table 30 in the Results). The progressive seems to affect the connectives "then", "when" and "before" the most in Thai. It is interesting that in the Conversation task, the Thai children did not use the progressive at all in their responses

to the questions. The progressive is not obligatory in Thai, in contrast to English or Lisu. In the Elicited imitation task, the use of the progressive has been forced onto the child.

5.2.7 Substitution Responses

Previous research reports that "and" is the first temporal connective acquired (Clancy et al 1976, Clark 1973). So it is expected that the youngest children in this study use this least restricted term for substitutions. In English, the most common substitution response to all temporal categories was "and", and for Age groups 1 (3;7-4;6) and 2 (3;7-5;6}, which conforms to these earlier results, and agrees with Keller-Cohen's findings (see Appendix 21). The most common substitution response was from "then" to "and", the second most common was from "before" to "and". This is not surprising as one interpretation of "and" is to indicate sequence, and all three connectives take the same mid-sentence position to order events. "when" is the most common substitution response for Age group 3 (5;7-6;6). The most common substitution was from "after" to "when". "when" is the first subordinating conjunction that emerges (Clancy et al 1976), it first indicates sequence and later simultaneity. In Age group 4 (6;7-7;6), "while" is the most common substituted response for Age group 4 (6;7-7;6), it is most often used for "when", perhaps indicating a tendency to interpret "when" simultaneously rather than sequentially in Age group 4 (6;7-7;6). Some other interesting substitution responses are that "since" is most commonly changed to "when", "until" to "before", "at the same time" to "when" or "while", "after" to "when", "while" to "when" and vice versa, "then" to "and", and "before" to "and".

In Lisu in Age groups 1 and 4, the most common substitution response is "thae", "when" (see Appendix 22). The most common substitution is from "before" to "when". Overall the most common

substitution response is to "bia" ("then/until"). The most common substitution is from "atiga", "then" to "bia", possibly indicating that the latter form is acquired earlier and/or is a more usual form. Other most common substitutions are from "when" to "bia" and vice versa, "since" to "after". These results seem to indicate that "thae" and "bia" are acquired early.

In Thai "when" is the most common substitution response (see Appendix 23). The most common substitution is from "after" to "when". Other most frequent substitutions are; from "then" to "and", "when" to "and", "since" to "when", "laew", the completed aspect marker is also used in Age group 1 (3:7-4;6) to indicate sequence. This indicates early acquisition of "when" and "and" in Thai. There were only a few substitution responses made in Thai.

I am interested in the substitution responses in the different languages for clues as to how the children perceive or interpret them. One problem is the small number of these responses made, particularly in Thai. I will now compare the substitution responses for "after" and "before" in the different languages in Table 34. The first two columns indicate the total number of substitutions to "before" or "after" in the different languages. The other two columns indicate the total number of changes made from "before" to "after" or vice versa, ie. in column 3 "after" is substituted for "before".

Table 34

	changed to "before"	changed to "after"	"before" -> "after"	"after" ->"before
ENGLISH	75	34	1	9
LISU	4	15	4	0
THAI	4	0	1	1

(-> indicates 'is changed to')

Even though the responses are small, certain trends are revealed. In English there are more substitutions to "before" than "after", and In Lisu there are more substitutions to "after" than "before". This directional trend is also reflected in the substitutions from "after" to "before" and "before" to "after" in English and in Lisu. In Thai there are only four substitutions to "before". These trends possibly reflect the relative ease of acquisition of these connectives in the different languages.

5.2.8 Types of Error Responses

In the Toy and Marble tasks, a common response made by the younger children (Age group 1 (3:7-4;6) in particular) in all the languages was to act out only one of the clauses. Similarly in the E.I. task a common response made by the younger children (Age group 1 (3:7-4;6) in particular} was to imitate only one of the clauses (see Appendix 26, (1)). The Lisu and Thai children, in particular the younger children produced one clause with only the verb and object, the subject was omitted. The English children did not make these type of responses (see Appendix 26, (2)). The Thai children omitted the connective the most (Appendix 26, (3)). The Lisu children omitted the Subject and used one Subject for the two clauses the most. Thai and

English children made very few of these types of errors (Appendix 26, (4) and (5)). The English children replicated the verb, so that the same verb is used in the two clauses, whereas Thai and Lisu children did not (Appendix 26, (6)). Thai children omitted the aspect marker the most (Appendix 26, (8)). As we can see the children from the different language groups used different strategies in this task. This gives us clues about the different languages, how they function and the different stages of development in acquiring the ability to connect clauses in the different languages.

It seems from the Elicited imitation data that children initially produce only one clause, or part of the clause; verb and "Object" without the "Subject" is produced by the youngest Thai and Lisu children. Lisu is a Topic-oriented rather than Subject- oriented language (see Methodology), and also Thai and Lisu are more discourse oriented languages than English, so the "Subject" does not have to be overtly expressed. A common strategy used by Lisu children in this task is to use the same "Subject" for both clauses, this reaches a maximum in Age group 2 (4;7-5;6). English children use the same verb for both clauses, this also reaches a maximum in Age group 2 (4;7-5;6). This is a strategy which reduces the information that needs to be encoded. A common strategy in all languages, is to omit the connective, the clauses are juxtaposed. This reaches a maximum in Age group 2 or 3. This is particularly common in Thai, which corresponds to the Conversation task data, where connectives were not used in the Thai children's responses. Also in Thai, few substitution responses were recorded compared to English or

Thai. It seems that omission of connective is the favoured response for Thai children. Thai children, in particular Age group 1 (3;7-4;6), omit the progressive aspect marker. This probably reflects the non-obligatory nature of the Thai progressive (see the Introductory Section, page 25 and page 45).

In summary the elicited imitation data indicates that children initially produce only one clause or idea, later they juxtapose the two independent clauses which express events in their order of occurrence. At a later stage they learn to use specific connectives to order the events in a more specific way.

5.3 The Main Results for Temporal Connectives in the Experimental Tasks.

The main results from the cross-linguistic research on temporal connectives in this study recorded is summarised, and the most likely explanations for these results are checked in Table 35.

TABLE 35 POSSIBLE CONTRIBUTING FACTORS FOR SOME OF THE RESULTS FOUND IN THE EXPERIMENTAL TASKS

RESULT	(1) SYNTACTIC	(2) SEMANTIC	(3) SEMANTIC VARIATN.	(4) TASK	(5) PRAGMATIC
"together" high score across languages and tasks		√			√
"together" is highest in English	√		√		
"then" relatively high score across languages and tasks		√			
"since" low score across languages and tasks		√			
"before" score is low in Lisu	√				
"when" is very low in the Thai Toy task			√	√	
"until" is low in the Thai Toy and E.I.tasks			√	√	
"after" is low in the Thai Marble and E.I. tasks				√	√
"while" has a relatively high score in English			√	√	

I will now give possible explanations for the results summarised in Table 35.

"**together**" has a relatively high scores across languages and tasks, due to its relative conceptual simplicity. The non-temporal meaning of "together"; to do an action with someone" seems to be acquired early. "together" in English has the highest score in all tasks, this could be due to the form used which has one form:one function in English, whereas in Thai and Lisu one form is used for two functions.

"**then**" which indicates simple sequence or order also seems to be relatively conceptually easy to acquire across languages.

"**since**" has a relatively low score across tasks and in all languages. It is conceptually difficult for the language learner, as it signals both order and duration. However it is rather perplexing that "until", which is semantically the mirror image of "since" does not show the same effect. This is possibly because of Pragmatic factors ; "until" is used in everyday language more than "since", eg. "until" is commonly used with children from an early age with negative commands, eg. "Don't go out until you've put your coat on". It appears that the children find "until" easier to conceptualise than "since".

"**before**" has a low score in Lisu, compared with other connectives and compared with Thai and English in the Marble and Toy tasks. This appears to be due to syntactic factors; "before" in Lisu in the Marble and Toy tasks, takes medial-clause position and so is not perceptually salient to the language learner.

"**when**" is low in Thai in the Toy task. This seems to be due to the strong interpretation of "when" as sequential in Thai when combined with telic expressions as used in the Toy task. "while"

in Thai seems to be sensitive to the aspect environment of the sentence too.

"**until**" is low in Thai in the Marble and Elicited imitation tasks, but not in the Toy task. This is probably because the Process expressions used in the Toy task, facilitate the interpretation of "until" in Thai. It seems that Thai speakers, perhaps due to the nonobligatory nature of the Thai progressive are particularly sensitive to sentential aspect for the interpretation of temporal connectives.

"**after**" is low in the Thai Marble and E.I. tasks. Perhaps this is due to the form of the sentence used in the task sentences;

"**Langjaak** chan gling luukgaew nuu gling luukgaew"

after I roll marble you roll marble

A more common way of expressing this would perhaps be to use the completed aspect marker "laew" after the first clause;

"**Langjaak** chan gling luukgaew **laew** nuu gling luukgaew", so that the clauses are separated, and the first clause completed.

Whereas "gorn", "before" takes mid-sentence position and has a function of completing the first clause too;

"chan gling luukgaew **gorn** nuu gling luukgaew". This actual usage would need to be examined further.

"**while**" has a relatively high score in English compared to Thai and Lisu in all the tasks. This seems to be due to the strong simultaneous interpretation of "while", regardless of the aspect environment of the sentence in English, compared to Lisu and in particular to Thai. It seems that "while" in English is relatively independent of aspect context, and has a relatively stable simultaneous reading.

I have considered only some of the results found in this study. It is difficult to explain other results with clear explanations as there are several possible explanations for the observed results, ie. the results could be due to task specific effects, due to the forms used in the different languages and to the range they operate in, familiarity and usage of the forms used in the tasks, and socio-cultural factors.

5.4 Final Remarks

Any approach to language acquisition has to take a multidimensional approach and consider the contributing factors to this process ie. cognitive, semantic, syntactic and the role of pragmatics. Such a multidimensional approach aims to delineate the interactive contribution of the different factors to the construction of the emergent system of the child, at different stages of development. Additionally a crosscultural approach also allows us to examine languages that differ structurally in key aspects to attempt to disentangle factors involved in learning a language. It also gives us a broader less anglocentric view of the process of language development. In the tasks carried out here, it is likely that cultural factors played a significant role. The English children on the whole seem to, not surprisingly perform the best, presumably due to familiarity with the type of tasks used and cultural factors. Thai children overall had the lowest performance. Thai children appeared to be more inhibited in speaking than either English or Lisu children, partially due to the role children have in the different societies (see Language Socialisation chapter 2). Lisu

children, even though they come from a less 'developed' environment, overall performed better than Thai children, again this is possibly due to the role of the child in the different societies. Lisu children are encouraged or expected to speak for themselves and be more autonomous. In the Conversation task, the responses of the Thai children in particular were short and economical.

From the research on the acquisition of temporal connectives examined in this thesis, it seems that syntax; the position of the connective in the clause or sentence, plays a relatively minor role in the age group of children (3;6-7;6 years) used in this study. There appears to be an effect of position of connective within the clause for "together" and "before" in Lisu, which take medial clause position in the Marble and Toy tasks. This gives support for research, which indicates that for a particle which operates on a clause, medial position is least salient to the child, in comparison to initial or final clause position. Children seem to be sensitive to the "scope or range" of a particle which operates on the meaning of a clause, and it should ideally be placed outside of the clause. The effect is not strong and not across the board. It seems in this study that other factors are playing a larger role, ie. semantics and pragmatics. Possibly syntax plays a more prominent role in younger children who are beginning to acquire the structural forms.

If fewer discriminations are made for a term in comparison to another term, the former can be regarded as conceptually simpler. "then" and "together" in this study seem to be

relatively conceptually simple for children, whereas "since" appears to be relatively conceptually difficult. Parallel findings for "until" were not found, which seems to suggest that "since" is conceptually more difficult for children than "until".

In Thai, marking of the progressive is non-obligatory, which can make the interpretation of verbal expressions as progressive or non-progressive ambiguous. It appears to make Thai children more sensitive to the aspect class of the clause or sentence for interpreting temporal connectives than English or Lisu children. The aspect class appears to affect the interpretation of the connectives "when" and "while" as sequential or simultaneous. This makes it unclear exactly where the main clause occurs in the nucleus of the "when" or "while" clause. The interpretation of "when" and "while" can be seen to vary with aspectual context, particularly in Thai. For English the interpretation of "while" as simultaneous seems to be relatively stable. The progressive also facilitates the interpretation of "when" sentences in English, but the interpretation of "at the same time" is not facilitated. This facilitatory effect on the interpretation of "when" sentences, is not reflected in the Thai or Lisu data. This research shows how the meaning of temporal connectives can vary with sentential context within and between languages. Temporal connectives do not have a simple invariant meaning, they are affected by the context of the clause or sentence.

The Moens and Steedman model is a useful model for characterising the function that a temporal connective has on

the two clauses that it operates on, and how the interpretation of the temporal connective is affected by the aspectual class of these two clauses. It is particularly valuable for examining how a connective is interpreted by the language learner at different stages of acquisition. The model can be used to see how varying the aspectual class of a clause or sentence affects the interpretation of a connective at different developmental stages, and how the connective and aspect class of the clause interact to affect the temporal interpretation of the two events in a sentence.

Research has shown that notions of verbal aspect are highly accessible to the child, and close to the meaning of the verb. Aspect systems emerge at an early age. Children quickly learn to separate forms for separate aspects (Slobin 1985). Stephany (1981) found that modality and aspect distinctions were marked as soon as verbs were used in Greek children.

It seems that verbal inflections are used to mark aspectual distinctions, before they indicate deictic tense notions in the early phases of language acquisition. de Lemos (1981) on Brazilian Portuguese children (1;0-2;5 years) found the emergence of tense forms to be governed by very strict linguistic (semantic) and extralinguistic restrictions. The earliest occurrence of perfective tense forms were with accomplishment verbs in contexts where the child was attending to the change of state resulting from unobserved processes. Progressive forms first occurred with activity verbs to call the attention to the activity the child was engaged in. Similarly Sachs (1983) found the very earliest instance of past reference

were to events with evident end results. By 2;2 years reference to non-goal orientated past events had appeared, ie. a flexible usage of tense markers had emerged indicating that tense as well as aspect was being encoded. Inflections seem to enter a child's system with a single function and gradually acquires a multifunctional status. Children are able to use past tense to encode tense well before 3 years old (Aksu-Koc 1988). This research indicates that in order to investigate the acquisition of tense and aspect marking, it is necessary to use younger children than were used in this study. However as Silva (1991) and Reilly (1986) have shown the acquisition of the interactive effect of aspect with temporal connectives is an ongoing process.

The actual test sentences used in this research are unnatural, they are out of context and real world non-congruent. World knowledge does not help in the interpretation of these 'unnatural' ambiguous sentences. To investigate the specifics of a tense-aspect system in a language, it is necessary to use specifically designed, elicited production tasks such as used by Aksu-Koc (1988), in conjunction with naturalistic observations. Aksu-Koc looked at the use of the two past tense markers, "-DI" and "-mis" in Turkish children (3;0-6;4) under different conditions. Situation aspect was controlled in the different tasks. Each task focussed on a different viewpoint aspect; the Stative task focussed on a static perspective, the Inference task focussed on a resultant state perspective, and the Process perceived task focussed on a dynamic perspective. For the Stative task, pictorial representations were used and

for the Inference and Process-perceived tasks situations were acted out using toys, and then the child was asked to describe the situation he/she had observed. The use of the two past tense markers was noted. This method of research could be used to separate out the finer distinctions of the use and acquisition of the Thai completed aspect/change of state marker "laew", the Lisu completed aspect and change of state markers, "woe" and "liu" respectively, and to examine more fully the acquisition of the progressive aspect in Thai, Lisu and English. Research needs to look at not only the sentential level as has been mainly focussed on in this research, but also at the discourse level.

The parallel results across languages in this research, eg. the acquisition of "since", "together" and "then", gives support to the idea of some type of universal cognitive pacesetter for temporal concepts. Learning how to categorise, in order to make sense of the world around, is one of the most basic cognitive capacities of the child in any culture. According to Bowerman (1985) it seems that the child is able to structure and interpret his/her experiences of the world around on a non-linguistic basis, prior to expressing it linguistically. According to this Cognitive view of language development when language starts to emerge, it does not introduce new meanings to the child, it is used to express only those meanings the child has already formulated independently of language. New forms of language are matched to, or 'map onto' preestablished concepts or categories of meaning. These meanings may not be isomorphic with the adult meanings identified with the forms in

question. Each form is matched to some preestablished meaning whatever that might be. Once the mapping has taken place, the meaning category guides the child's initial generalization of the forms to novel contexts, ie. the child uses the form only in connection with the meaning that he/she has identified with it, and the breadth of such a category that a child associates with a particular form may narrow or broaden over time with experience of and, with the world around. Recent research has shown that this view of language development is too simplified a model, and that there is most likely to be a two-way interaction between cognitive development and the specific categories and boundaries of the language being learnt.

In this research interesting language specific differences emerged, eg. the acquisition of "before", "after", "until", "when", "while" and "together", which can be explained in terms of the following language specifics; syntax, semantic range of the terms in the different languages, cultural and pragmatic factors. As Slobin (1979) points out languages are selective in what they encode, pulling out certain meaning distinctions for obligatory marking and ignoring others that the speaker is presumably equally capable of expressing. In the languages of this study there are quite marked differences, in what temporal concepts are encoded. The English temporal system encodes both tense and aspect, whereas Thai and Lisu temporal systems encode only aspect and not tense. Thai and Lisu also mark completed action and change of state aspect with separate markers, whereas in English this is confounded by tense marking. Progressive aspect has obligatory marking in English and Lisu, whereas in

Thai it appears to be non-obligatory. Further Thai and Lisu have other devices, besides connectives to express the function of temporal connectives in English. Different devices are used in different languages to express the same or similar temporal concepts or notions. Some of these devices are easier to learn for the child than others. The child needs to learn not only how to encode these meanings, but also which meanings to encode, ie. the child needs to determine which subset of notions receives formal marking in his/her language. de Lemos (1981) underlines the role of language in determining how the child comes to cut up the flow of events into constituent parts. According to her, the development of tense-aspect markers arise through social interaction. The important role of discourse is emphasised. Through discourse children discover the semantic/syntactic structure of their specific language. The development of tense forms proceeds from being closely tied to extralinguistic context to acquiring a totally context-independent status (Aksu-Koc 1988). The differentiation of tense and aspect takes place in the course of discourse with adults (Berman et al 1981) or other caretakers. The ability to elaborate more independently and on topics that are increasingly displaced with respect to the "here and now" only emerge in the second half of the second year. Throughout the course of discourse, temporal referents are being set up and are constantly being updated and redefined. World knowledge is constantly being referred to and inferences are being made. This world knowledge is defined by the physical and cultural environment of the child. Different parts of events are focussed on, emphasised and linked to other events,

throughout the course of discourse. Research needs to focus on how temporal reference is acquired through discourse as well as concentrating on the sentential level, in different languages and cultures, in an attempt to disentangle the various contributing factors involved in the acquisition of temporal reference.

It is interesting to trace the variation in meaning a temporal term has to a child through the course of acquisition in different languages. As has been previously stated, the Moens and Steedman model is a useful model for tracing the different stages in acquisition of a temporal term. The process of language acquisition is a constant readjusting of the balance between linguistic forms and their semantic functions, reflecting the largely separate but interactive systems of language and cognition. Learning the various semantic functions requires an extended period of time. Development is a progression from the here and now to the more general and abstract. These changes reflect the child's developing cognitive abilities, ie. the increasing ability to handle more complex and abstract ideas and to integrate these ideas with the appropriate linguistic forms (Reilly 1986).

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APPENDIX 1

SUMMARY OF THE WORD ORDER USED IN THE TEST SENTENCES

CONNECTIVE		POSITION IN SENTENCE OF CONNECTIVE	LANGUAGE
THEN	You roll your marble **then** I roll my marble	mid	ENGLISH
	--------clause1----- **then** -----clause2---	mid	THAI
	--------clause1----- **then** -----clause2---	mid	LISU
	SAME FOR ALL TASKS		
AFTER	**After** you roll your marble,I roll my marble	initial	ENGL
	After ----clause1------ ---clause2------	initial	THAI
	--------- clause1---- **after** ---clause2------	mid	LISU
	SAME FOR ALL TASKS		
BEFORE	You roll your marble **before** I roll my marble	mid	ENGL
	------clause1------- **before** ----clause2-----	mid	THAI
	SANE FOR ALL TASKS		
	FOR E.I. TASK	mid	LISU
	'You marble **before** roll I marble roll'	pre-verbal	LISU
	SAME FOR MARBLE AND TOY TASKS	(first clause)	
WHEN	**When** you roll your marble, I roll my marble	initial	ENGL
	When ----clause1-------- ---clause2------	initial	THAI
	----clause1----------**when** ---clause2------	mid	LISU
	SAME FOR ALL TASKS		
TOGETHER	You throw you marble and I throw my marble **together**	final	ENGL
	FOR E.I. TASK "at the same time" USED		
	-----clause1--------'and'---clause2----- **together**	final	THAI
	SAME FOR ALL TASKS		
	'You marble and I **together** throw'	preverbal	LISU
	SAME FOR TOY AND MARBLE TASKS	(second clause)	
	----clause1-----'and'---clause2-------- **together**	final	LISU
	FOR E.I. TASK		

APPENDIX 1

UNTIL	You <u>don't</u> roll your marble **until** I roll my marble	mid + negative	ENGL
	FOR MARBLE TASK		
	-------clause1----- **until** ----clause2-------	mid	
	FOR TOY AND E.I. TASKS		
	<u>Don't</u> roll marble your **until** I roll marble mine'	mid	THAI
	'You marble <u>not</u> throw <u>yet</u> I marble throw **until** is'	final	LISU
	MARBLE TASK		
	----clause1--------- **until** -----clause2-------	mid	
	FOR TOY AND E.I. TASKS		
SINCE	**Since** -----clause1--, -------clause2--------	initial	ENGL
	SAME AS ENGLISH		THAI
	------clause1---- **since** -----clause2--------	mid	LISU
	FOR TOY AND E.I. TASKS ONLY		
WHILE	**While** -----clause1---, ------clause2------	initial	ENGL
	While -----clause1---,-------clause2-------	initial	THAI
	'I marble throw **PAM when** you marble throw **PAM**'	mid+PAM	LISU

<u>ASPECT MARKERS USED</u> E.I. TASK ONLY

The boy **was** bring**ing** the water	**CONN**	preverbal 'was'	ENGLISH
the girl was light**ing** the fire	+	postverbal 'ing'	
'boy **PAM** bring water **CONN** girl **PAM** light fire'		preverbal	THAI
'boy water bring **PAM CONN** girl fire light **PAM**'		postverbal, final position in clause	LISU

(PAM=progressive aspect marker, CONN=connective)

APPENDIX 2

QUESTIONNAIRE ABOUT LANGUAGE SOCIALISATION OF THE CHILD

A. Background Information

How many children do you have?

How old are they? Are they girls or boys?

Who looks after them?

Who lives in the household?

Where do the children sleep?

B. The Prelinguistic Child

What are the first noises a baby makes? Examples?

Do they have meaning? What meaning?

Any other noises?

What are the next noises a baby makes when it is a bit older?

Does a baby make different noises? Examples?

Do you understand them?

Does he/she make them in different situations?

When does he/she make them?

If he/she cries what do you do?

Do adults talk to babies?

How do adults talk to babies?

Do they speak the same as to adults or older children? How is it different?

C. The Linguistic Child

What is the first word a baby normally says?

What does a toddler normally ask for/want?

How does he/she speak? Examples?

Do you understand what he/she wants?

Does he/she understand you when you speak?

APPENDIX 2

Do they make mistakes? What mistakes?

Do you correct the mistakes?

When does a child speak well? What age about?

How does a child learn how to speak?

Do you need to teach a child how to speak?

Does a child understand before he/she can speak?

D. Attitudes and Beliefs

Is it important to be able to speak well?

What age does a child speak well?

What is impolite/good behaviour in a child?

What is a naughty child?

What is a good child?

How should a child behave to adults?

How should a child speak to adults?

Are there any times/situations when a child should not speak to an adult?

What is impolite language in a baby/infant/child/older child/adult?

When do you expect a child to be polite?

What are important things to teach a child?

When/what age do you teach them this?

How do you punish a naughty child?

Is it important for a boy/girl/adult to speak well?

Do boys speak better than girls or vice versa?

If a child does not respond when addressed is this impolite?

What age do you expect a child to respond when addressed?

When do you say "no" to your child?

APPENDIX 2

E. Background and Activities of the Child

What does each child do each day?

What household tasks does each child do each day?

Do you or any adult play with the baby/child?

What do you play?

What games do your children play? Who with?

Do children ever do things by themselves? What?

When does a child feed itself?

Does the baby have breast or bottle milk?

How long do you breastfeed for?

When do you give solids to a baby? What foods?

Who washes/feeds/looks after the child?

What are children afraid of?

F. Informal Observations

Language spoken to the child - characteristics?

Who speaks to the child? Simplified? High pitch, repetitive? etc.

Special language spoken to the child? Special words? Questions,

statements, imperatives used?

When the baby makes a sound what do people do?

Do adults correct a lot? Do adults watch children's behaviour a lot? Do

they tell them how to behave?

Do they play with the baby/child? How? Who does?

Who looks after the baby?

What do they teach children?

How do they punish children?

How do they hold/carry the child/baby?

APPENDIX 2

Who carries/holds the child?

Who do children play with?

What games do children play? Who with?

APPENDIX 3

CONVERSATION TASK QUESTIONS

1. Before breakfast what do you normally do?
2. After breakfast what do you normally do?
3. In the evening after eating what do you do?
4. Before you go to bed what do you do?
5. After waking up in the morning what do you do?
6. What do you do at school/nursery each day?
7. Yesterday what did you do?
8. Tomorrow what will you do?
9. Have you ever been to Newcastle?
10. What did you do there?
11. What is your Dad doing today?
12. What is your Mum doing today?
13. What did your Dad do yesterday?
14. What did your Mum do yesterday?
15. What is the boy doing now?
16. What is your brother doing now?
17. What will your brother do tomorrow?
18. What do you like doing most?

APPENDIX 4

THE MARBLE TASK - THE ENGLISH TEST SENTENCES

Materials for the Marble Task: For half of the test sentences 2 marbles were used, one for the assistant or experimenter and one for the subject. For the other half of the sentences 2 plastic toy cars were used instead of the marbles, to maintain the child's interest in the task.

THE MARBLE TASK - ENGLISH TEST SENTENCES

1. I roll my marble **then** you roll your marble.
2. **After** I roll my marble, you roll your marble.
3. **When** I roll my marble, you roll your marble.
4. You don't roll your marble **until** I roll my marble.
5. **While** I roll my marble, you roll your marble.
6. You and I roll our marbles **together.**
7. You roll your marble **then** I roll my marble.
8. You roll your marble **before** I roll my marble.
9. **While** I roll my marble, you roll your marble.
10. You and I roll our marbles **together.**
11. I roll my marble **then** you roll your marble.
12. You roll your marble **before** I roll my marble.
13. **After** I roll my marble, you roll your marble.
14. **While** I roll my marble, you roll your marble.
15. You don't roll your marble **until** I roll my marble.
16. You roll your marble **then** I roll my marble.
17. You and I roll our marbles **together.**
18. **After** I roll my marble, you roll your marble.
19. You don't roll your marble **until** I roll my marble.

APPENDIX 4

20. **When** I roll my marble, you roll your marble.
21. You roll your marble **before** I roll my marble.
22. You roll your car **then** I roll my car.
23. **While** I roll my car, you roll your car.
24. I roll my car **then** you roll your car.
25. **After** you roll your car, I roll my car.
26. I and you roll our cars **together**.
27. You don't roll your car **until** I roll my car.
28. I roll my car **before** you roll your car.
29. **When** you roll your car, I roll my car.
30. **After** you roll your car, I roll my car.
31. **While** I roll my car, you roll your car.
32. I roll my car **before** you roll your car.
33. You don't roll your car **until** I roll my car.
34. **When** I roll my car, you roll your car.
35. I and you roll our cars **together**.
36. **After** you roll your car, I roll my car.
37. **While** I roll my car, you roll your car.
38. You don't roll your car **until** I roll my car.
39. **When** you roll your car, I roll my car.
40. I roll my car **before** you roll your car.
41. I and you roll our cars **together**.
42. **While** I roll my car, you roll your car.

APPENDIX 5

THE MARBLE TASK - THE LISU TEST SENTENCES

1. ngwa luukgaew-ngwa-geu lefu **atiga** noo luukgaew-noo lefu.
   I marble - i - of roll then you marble - you roll
   I roll my marble then you roll your marble.

2. ngwa luukgaew lefu **ganya** noo-geu lefu.
   I marble roll after you-of roll
   After I roll my marble you roll your marble.

3. ngwa luukgaew lefu **thae** noo-geu lefu.
   I marble roll when you-of roll
   When I roll my marble, you roll your marble.

4. noo luukgaew tha lefu he ngwa luukgaew lefu **bia ngu**.
   you marble don't roll yet I marble roll until **affirmative**
   You don't roll your marble until I roll my marble.

5. noo luukgaew gigi ngwa luukgaew **itilae** lefu.
   you marble and/with I marble together roll
   You and I roll our marbles together.

6. ngwa luukgaew lefu **kya thae** noo lefu.
   I marble roll prog.when you roll
   While I roll my marble you roll your marble.

7. noo luukgaew lefu **atiga** ngwa-geu lefu.
   you marble roll then I -of roll
   You roll your marble then I roll my marble.

8. noo luukgaew **gache** lefu ngwa-geu lefu.
   you marble before roll I - of roll
   You roll your marble before I roll my marble.

9. ngwa luukgaew lefu **kya thae** noo lefu.
   I marble roll prog.when you roll
   While I roll my marble you roll your marble.

10. ngwa luukgaew-ngwa-geu lefu **atiga** noo luukgaew-noo lefu.
    I marble - I - of roll then you marble -you roll
    I roll my marble then you roll your marble.
    etc.

APPENDIX 6

THE MARBLE TASK - THE THAI TEST SENTENCES

1. Chan gling luukgaew **laew gor** nuu gling luukgaew.
   I roll marble then you roll marble
   I roll my marble then you roll your marble.

2. **Langjaak** chan gling luukgaew nuu gling luukgaew.
   after I roll marble you roll marble
   After I roll my marble you roll your marble.

3. **Meua** chan gling luukgaew nuu gling luukgaew.
   when I roll marble you roll marble
   When I roll my marble you roll your marble.

4. Nuu yah gling luukgaew-nuu **theung** chan gling luukgaew.
   you don't roll marble- you until I roll marble
   You don't roll your marble until I roll my marble.

5. Nuu leh chan gling luukgaew **duaygan**.
   you and I roll marble together
   You and I roll our marbles together.

6. **Kana thii** chan gling luukgaew nuu gling luukgaew.
   while I roll marble you roll marble
   While I roll my marble you roll your marble,

7. Nuu gling luukgaew **laew gor** chan gling luukgaew.
   you roll marble then I roll marble
   You roll your marble then I roll my marble.

8. Nuu gling luukgaew **gorn** chan gling luukgaew.
   you roll marble before I roll marble
   You roll your marble before I roll my marble.

9. **Kana thii** chan gling luukgaew nuu gling luukgaew.
   while I roll marble you roll marble
   While I roll my marble you roll your marble.

10. Nuu leh chan gling luukgaew **duaygan**.
    you and I roll marble together
    You and I roll our marbles together.
    etc.

APPENDIX 7

THE TOY TASK - THE ENGLISH TEST SENTENCES

Materials for the Toy Task: These consisted of 3 small, plastic toy animals, a pig, a dog and a hen (all three language groups are familiar with these animals) and a tree and a fence.

THE TOY TASK - ENGLISH TEST SENTENCES

1. The hen jumps over the fence **before** running around the tree.
2. **After** the dog hits the pig, the dog hits the hen.
3. **When** the pig jumps over the fence, the dog jumps over the fence.
4. **While** the dog runs around the tree, the hen runs around the tree.
5. The pig and hen run around the tree **together**.
6. **Since** the dog jumped over the fence, the hen has been sleeping.
7. The pig sleeps **until** the dog jumps over the fence.
8. **When** the dog jumps over the fence, the hen jumps over the fence.
9. **Since** the pig has been sleeping, the hen has been jumping over the fence.
10. The pig and the hen jump over the fence **together.**
11. **After** the hen jumps over the fence, the hen runs around the tree.
12. **While** the pig runs around the tree, the dog runs around the tree.
13. The dog hits the pig **before** the dog hits the hen.
14. The hen sleeps **until** the pig hits the hen.
15. The pig jumps over the fence **then** runs around the tree.
16. The hen hits the pig **then** hits the dog.
17. **Since** the dog has been sleeping, the hen has been jumping over the fence.
18. The hen sleeps **until** the pig runs around the tree.

APPENDIX 7

19. The pig jumps over the fence **then** runs around the tree.

20. **While** the dog sleeps, the hen jumps over the fence.

21. **After** the dog hits the hen, the dog hits the pig.

22. **When** the pig runs around the tree, the dog runs around the tree.

23. **Since** the hen jumped over the fence, the pig has been sleeping.

24. The dog and the pig run around the tree **together.**

25. The pig runs around the tree **then** jumps over the fence.

26. The pig jumps over the fence **before** the dog jumps over the fence.

27. **While** the dog runs around the tree, the pig sleeps.

28. **After** the pig runs around the tree, the pig jumps over the fence.

29. **Since** the hen has been sleeping, the pig has been running around the tree.

30. The hen hits the pig **then hits the dog.**

31. The dog jumps over the fence **until** the dog sleeps.

32. The hen and the dog run around the tree **together.**

33. **While** the hen sleeps, the pig jumps over the fence.

34. The pig sleeps **until** the dog hits the pig.

35. **After** the dog runs around the tree, the dog jumps over the fence.

36. The hen hits the dog **then** the hen hits the pig.

37. The pig jumps over the fence **before running around the tree.**

38. The pig and the dog sleep **together.**

39. When the dog jumps over the fence, the hen jumps over the fence.

40. The dog runs around the tree **before** jumping over the fence.

41. The pig and the dog run around the tree **together.**

APPENDIX 7

42. While the hen jumps over the fence, the pig sleeps.

43. After the pig jumps over the fence, the hen runs around the tree.

44. Since the hen ran around the tree, the pig has been sleeping.

45. When the dog runs around the tree, the pig runs around the tree.

46. The pig jumps over the fence until the pig sleeps.

47. The pig runs around the tree before jumping over the fence.

48. When the hen jumps over the fence, the pig jumps over the fence.

APPENDIX 8

THE TOY TASK - THE LISU TEST SENTENCES

1. Agha betchua **gache** dekooa seuzeu tjua.
   hen fence before jump tree run-round
   The hen jumps over the fence before running around the tree.

2. Ana ave bigheu **ganya** ana agha bigheu.
   dog pig bumps after dog hen bumps
   The dog bumps the big before the dog bumps the hen.

3. Ave betchua dekooa **thae** ana betchua dekooa.
   pig fence jump when dog fence jump
   When the pig jumps over the fence, the dog jumps over the fence.

4. Ana seuzeu tchua **kya thae** agha seuzeu tchua **kya**.
   dog tree run-round prog.when hen tree run-round prog.
   While the dog runs round the tree, the hen runs round the tree.

5. Ave gigi agha seuzeu **itilae** tchua.
   pig and/with hen tree together run-round
   The pig and the hen run round the tree together.

6. Ana betchua dekooa **gapuma** agha itda**kya**.
   dog fence jump since hen sleep-prog.
   Since the dog jumped over the fence the hen has been sleeping.

7. Ave itda**kya bia** ana betchua dekooa.
   pig sleep-prog. then/until dog fence jump
   The pig sleeps until the dog jumps over the fence.

8. Ana betchua dekooa **thae** agha betchua dekooa.
   dog fence jump when hen fence jump
   When the dog jumps over the fence, the hen jumps over the fence.

9. Ave itda**kya gapuma** agha betchua dekooa **kya**.
   pig sleep-prog.since hen fence jump-prog.
   Since the hen has been sleeping, the hen has been jumping over the fence.

10. Ana gigi agha betchua **itilae** dekooa.
    dog and/with hen fence together jump
    The dog and the hen jump over the fence together.

11. Agha betchua dekooa **ganya** agha seuzeu tchua.
    hen fence jump after hen tree run-round
    After the hen jumps over the fence, the hen runs round the tree.

APPENDIX 8

12. Ave seuzeu tchua **kya thae** ana seuzeu tchua **kya.**
pig tree run-round prog.when dog tree run-round prog.
While the pig runs round the tree, the dog runs round the tree.

13. Ana ave **gache** bigheu ana agha bigheu.
dog pig before hit dog hen hit
The dog hits the pig before the dog hits the hen.
etc.

APPENDIX 9

THE TOY TASK - THE THAI TEST SENTENCES

1. Gai gradoed kam rooa **gorn** wing rorp ton mai.
   hen jump over fence before run round tree
   The hen jumps over the fence before running round the tree.

2. **Langjaak** maa chon muu maa chon gai.
   after dog hit pig dog hit hen
   After the dog hits the pig the dog hits the hen.

3. **Meua** muu gradoed kam rooa maa gradoed kam rooa.
   when pig jump over fence dog jump over fence
   When the pig jumps over the fence the dog jumps over the fence.

4. **Kan thii** maa wing rorp ton mai gai wing rorp ton mai.
   while dog run round tree hen run round tree
   While the dog runs round the tree, the hen runs round the tree.

5. Muu gap gai wing rorp ton mai **duaygan.**
   pig with/and hen run round tree together
   The pig and the hen run round the tree together.

6. **Tang tae** maa gradoed kam rooa gai gamlang non.
   since dog jump over fence hen prog. sleep
   Since the dog jumped over the fence, the hen has been sleeping.

7. Muu gamlang non **theung** maa gradoed kam rooa.
   pig prog. sleep until dog jump over fence
   The pig sleeps until the dog jumps over the fence.

8. **Meua** maa gradoed kam rooa gai gradoed kam rooa.
   when dog jump over fence hen jump over fence
   When the dog jumps over the fence the hen jumps over the fence.

9. **Tang tae** muu gamlang non gai gradoed kam rooa.
   since pig prog. sleep hen jump over fence
   Since the pig has been sleeping, the hen has been jumping over the fence.

10. Muu gap gai gradoed kam rooa **duaygan.**
    pig with/and hen jump over fence together
    The pig and the hen jump over the fence together.

11. **Langjaak** gai gradoed kam rooa gai wing rorp ton mai.
    after hen jump over fence hen run-round tree
    After the hen jumps over the fence, the hen runs round the tree.

12. **Kana thii** muu wing rorp ton mai maa wing rorp ton mai.
    while pig run round tree dog run round tree
    While the pig runs round the tree, the dog runs round the tree.

13. Maa chon muu **gorn** maa chon gai.
    dog hit pig before dog hit hen
    The dog hits the pig before the dog hits the hen.

APPENDIX 10

THE ELICITED IMITATION TASK - THE ENGLISH TEST SENTENCES

Materials for the Elicited Imitation Task: A portable cassette player was used to record the responses of the child.

THE ELICITED IMITATION TASK - ENGLISH TEST SENTENCES

1. The boy brings the water **then** the girl lights the fire.
2. **When** the girl was throwing the stones, the boy was playing the guitar.
3. The boy brings the water **before** the girl lights the fire.
4. **While** the boy washes the plates, the girl sweeps the floor.
5. **After** the boy was washing the plates, the girl was sweeping the floor.
6. **When** the girl makes the food, the boy cuts the wood.
7. The boy was bringing the water and the girl was lighting the fire **at the same time.**
8. **After** the girl throws the stones, the boy plays the guitar.
9. The boy was bringing the water **then** the girl was lighting the fire.
10. The boy washes the dishes **until** the girl sings a song.
11. **After** the boy was bringing the water, the girl was lighting the fire
12. The girl was washing the clothes **before** the boy was cutting the wood.
13. The boy brings the water and the girl lights the fire **at the same time.**
14. The boy was washing the plates **then** the girl was sweeping the floor.
15. **When** the girl was making the food, the boy was cutting the wood.
16. **Since** the boy washed the plates, the girl has been sewing the material.
17. **While** the boy brings the water, the girl sings a song.

18. The girl was throwing the stones and the boy was playing the guitar **at the same time.**

19. The boy brings the water **until** the girl lights the fire.

20. The girl makes the food **before** the boy cuts the wood.

21. The girl throws the stones and the boy plays the guitar **at the same time.**

22. **When** the boy brings the water, the girl lights the fire.

23. The girl washes the clothes **then** the boy cuts the wood.

24. **Since** the girl ate the sweet, the boy has been making a boat.

25. The boy was bringing the water **before** the girl was lighting the fire.

26. **After** the boy washes the plates, the girl sweeps the floor.

27. **While** the girl plays the guitar, the boy makes a boat.

28. **After** the boy was throwing the stones, the girl was playing the guitar.

29. The girl washes the clothes **until** the boy throws a stone.

30. The girl was throwing stones **before** the boy was playing the guitar.

31. The boy was bringing the water **then** the girl was lighting the fire.

32. **After** the girl makes the food, the boy cuts the wood.

33. **When** the boy washes the plates, the girl sweeps the floor.

34. The girl was making the food and the boy was cutting the wood **at the same time.**

35. **After** the girl was washing the clothes, the boy was cutting the wood.

36. The girl throws stones **before** the boy plays the guitar.

37. The girl makes the food and the boy cuts wood **at the same time.**

38. **When** the boy was bringing the water, the girl was lighting the fire.

APPENDIX 10

39. The boy washes the plates **then** the girl sweeps the floor.

40. **After** the boy brings the water, the girl lights the fire.

41. **While** the girl plays the guitar, the boy makes a boat.

42. The boy was washing the plates **before** the girl was sweeping the floor.

43. **Since** the girl lit the fire, the boy has been cutting the wood.

44. The girl throws the stones **then** the boy plays the guitar.

45. The boy washes the plates **before** the girl sweeps the floor.

46. **When** the girl throws the stones, the boy plays the guitar.

47. The girl throws stones **until** the boy plays the guitar.

48. The boy was washing the plates and the girl was sweeping the floor **at the same time.**

49. **Since** the boy brought the water, the girl has been making the food.

50. **When** the girl was washing the plates, the boy was sweeping the floor.

51. The girl was throwing stones **then** the boy was playing the guitar.

52. The boy washes the plates and the girl sweeps the floor **at the same time.**

APPENDIX 11

THE ELICITED IMITATION TASK - THE LISU TEST SENTENCES

1. Zanua adya de la **atiga** zamua adtu tse.
   boy water bring then girl fire light
   The boy brings the water then the girl lights the fire.

2. Zamua latsuba lu **kya thae** zanua seu beu ganya **kya.**
   girl stone throw prog.when boy guitar play prog.
   While the girl is throwing the stones, the boy is playing the guitar.

3. Zanua adya **gache** de la zamua adtu tseu.
   boy water before bring girl fire light
   The boy brings the water before the girl lights the fire.

4. Zanua le ge tseu **kya ganya** zamua me cha sheu **kya.**
   boy plate wash prog. after girl floor sweep prog.
   After the boy is washing the plates, the girl is sweeping the floor.

5. Zanua adya de la **kya atiga** zamua adtu tse **kya itilae.**
   boy water bring prog. then girl fire light prog. together
   The boy is bringing the water and the the girl is lighting the fire at the same time.

6. Zamua za opia sha **thae** zanua seu deua.
   girl food cook when boy wood cut
   When the girl cooks the food, the boy cuts the wood.

7. Zamua latsuba lu **ganya** zanua seu beu ganya.
   girl stone throw after boy guitar play
   After the girl throws the stones, the boy plays the guitar.

8. Zanua adya de la **kya atiga** zamua adtu tseu **kya.**
   boy water bring prog.then girl fire light prog.
   The boy is bringing the water then the girl is lighting the fire.

9. Zamua be che tsu **kya gache** zanua seu deu **kya.**
   girl clothes wash prog.before boy wood cut prog.
   The girl is washing the clothes before the boy is cutting the wood.

10. Zanua le gu tseu **kya bia** zamua ngu gwa gwa.
    boy plates wash prog.then/until girl song sing
    The boy is washing the plates until the girl sings a song.

11. Zanua adya de la **kya ganya** zamua adtu tseu **kya.**
    boy water bring prog. after girl fire light prog.
    After the boy is bringing the water, the girl is lighting the fire.

12. Zanua le ge tseu **kya atiga** zamua me cha sheu **kya.**
boy plates wash prog.then girl floor sweep prog.
The boy is washing the plates then the girl is sweeping the floor.

13. Zamua za opia sha **kya thae** zanua seu deu **kya.**
girl food cook prog. when boy wood cut prog.
When the girl is making the food, the boy is cutting the wood.

14. Zanua le ge tseu **gapuma** zamua me seu **kya.**
boy plates wash since girl cloth sew prog.
Since the boy washed the plates the girl has been sewing the cloth.
etc.

APPENDIX 12

THE ELICITED IMITATION TASK - THE THAI TEST SENTENCES

1. Dek chai ao nam maa **laew gor** dek ying jut fai.
   boy bring water come then girl light fire
   The boy brings the water then the girl lights the fire.

2. **Meua** dek ying kamlang gling gorn hin dek chai kamlang len gitar.
   when girl prog. throw stones boy prog. play guitar
   When the girl is throwing the stones, the boy is playing the guitar.

3. dek chai ao nam maa **gorn** dek ying jut fai.
   boy bring water come before girl light fire
   The boy brings the water before the girl lights the fire.

4. **Langjaak** dek chai gamlang lahng jaan dek ying kamlang gwaat peun.
   after boy prog. wash plates girl prog. sweep floor
   After the boy is washing the plates, the girl is sweeping the floor.

5. Dek chai kamlang ao nam maa leh dek ying kamlang jut fai **duaygan**.
   boy prog. bring water come and girl prog. light fire together
   The boy is bringing the water and the girl is lighting the fire together.

6. **Meua** dek ying tam ahaan dek chai tat mai.
   when girl make food boy cut wood
   When the girl makes the food the boy cuts the wood.

7. **Langjaak** dek ying gling gorn hin dek chai len gitar.
   after girl throw stone boy play guitar
   After the girl throws the stones, the boy plays the guitar.

8. Dek chai kamlang ao nam maa **laew gor** dek ying kamlang jut fai.
   boy prog. bring water come then girl prog. light fire
   The boy is bringing the water then the girl is lighting the fire.

9. Dek ying kamlang sak pah **gorn** dek chai kamlang tat mai.
   girl prog. wash clothes before boy prog. cut wood
   The girl is washing the clothes before the boy is cutting the wood.

10. Dek chai kamlang lahng jaan **theung** dek ying rong pleyng.
    boy prog. wash plates until girl sing song
    The boy is washing the plates until the girl sings a song.

11. **Langjaak** dek chai gamlang ao nam maa dek ying kamlang jut fai.
after boy prog. bring water come girl prog. light fire
After the boy is bringing the water the girl is lighting a fire.

12. Dek chai kamlang lahng jaan **laew gor** dek ying kamlang gwaat peun.
boy prog wash plates then girl prog. sweep floor
The boy is washing the plates then the girl is sweeping the floor.

13. **Meua** dek ying kamlang tam ahaan dek chai kamlang tat mai.
when girl prog. make food boy prog cut wood
When the girl is making the food the boy is cutting the wood.

14. **Tang tae** dek chai lahng jaan dek ying kamlang yep pah.
since boy wash plate girl prog sew cloth
Since the boy washed the plates the girl has been sewing the material.
etc.

APPENDIX 13

MULTIFACTORIAL ANALYSIS OF VARIANCE FOR THE MARBLE TASK

Cell Means and Standard Deviations

Variable - "THEN"

FACTOR	CODE		Mean	Std. Dev.	N
LANGUAGE	1	LISU			
AGEGP	1		4.200	.632	10
AGEGP	2		4.100	1.197	10
AGEGP	3		5.100	.568	10
AGEGP	4		5.800	.422	10
LANGUAGE	2	THAI			
AGEGP	1		3.800	.919	10
AGEGP	2		3.800	1.033	10
AGEGP	3		5.100	.738	10
AGEGP	4		6.000	.000	10
LANGUAGE	3	ENGLISH			
AGEGP	1		4.800	.919	10
AGEGP	2		4.600	1.350	10
AGEGP	3		5.900	.316	10
AGEGP	4		5.900	.316	10
For entire sample			4.925	1.109	120

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LANGUAGE	3 - ENGLISH			
AGEGP	1	1.700	1.418	10
AGEGP	2	3.700	2.312	10
AGEGP	3	5.100	1.197	10
AGEGP	4	4.600	1.578	10
For entire sample		3.325	1.992	120

Variable - "WHEN"

FACTOR	CODE		Mean	Std. Dev.	N
LANGUAGE	1	- LISU			
AGEGP	1		2.400	1.506	10
AGEGP	2		3.800	1.135	10
AGEGP	3		4.200	1.135	10
AGEGP	4		5.300	.949	10
LANGUAGE	2	- THAI			
AGEGP	1		3.000	1.563	10
AGEGP	2		4.500	1.434	10
AGEGP	3		4.400	1.430	10
AGEGP	4		5.400	.699	10
LANGUAGE	3	- ENGLISH			
AGEGP	1		2.000	1.247	10
AGEGP	2		2.800	1.317	10
AGEGP	3		4.100	1.197	10
AGEGP	4		5.100	.568	10
For entire sample			3.917	1.596	120

Variable - "BEFORE"

FACTOR	CODE		Mean	Std. Dev.	N
LANGUAGE	1	- LISU			
AGEGP	1		3.500	1.434	10
AGEGP	2		3.300	1.418	10
AGEGP	3		5.000	.943	10
AGEGP	4		5.700	.483	10
LANGUAGE	2	- THAI			
AGEGP	1		2.500	1.354	10
AGEGP	2		4.300	1.829	10
AGEGP	3		5.600	.699	10
AGEGP	4		5.900	.316	10
LANGUAGE	3	- ENGLISH			
AGEGP	1		3.700	1.494	10
AGEGP	2		5.300	1.059	10
AGEGP	3		5.700	.483	10
AGEGP	4		5.800	.422	10
For entire sample			4.692	1.549	120

Variable - "UNTIL"

FACTOR	CODE		Mean	Std. Dev.	N
LANGUAGE	1	- LISU			
AGEGP	1		4.000	1.700	10
AGEGP	2		4.900	1.101	10
AGEGP	3		6.000	.000	10
AGEGP	4		5.900	.316	10
LANGUAGE	2	- THAI			
AGEGP	1		2.500	1.354	10
AGEGP	2		1.700	1.947	10
AGEGP	3		2.700	1.889	10
AGEGP	4		3.800	1.687	10

LANGUAGE	3 - ENGLISH			
AGEGP	1	3.500	1.958	10
AGEGP	2	4.800	1.687	10
AGEGP	3	5.900	.316	10
AGEGP	4	6.000	.000	10
For entire sample		4.308	1.961	120

Variable - "TOGETHER"

FACTOR	CODE	Mean	Std. Dev.	N
LANGUAGE	1 - LISU			
AGEGP	1	3.700	1.059	10
AGEGP	2	5.000	.667	10
AGEGP	3	5.800	.422	10
AGEGP	4	5.900	.316	10
LANGUAGE	2 - THAI			
AGEGP	1	4.400	1.430	10
AGEGP	2	5.500	.707	10
AGEGP	3	5.900	.316	10
AGEGP	4	5.900	.316	10
LANGUAGE	3 - ENGLISH			
AGEGP	1	5.400	.966	10
AGEGP	2	5.700	.675	10
AGEGP	3	6.000	.000	10
AGEGP	4	6.000	.000	10
For entire sample		5.433	.968	120

ANALYSIS OF VARIANCE

(**=significant at the 1% level of significance, *=significant at the 5% level of significance).

EFFECT OF LANGUAGE BY AGEGP

Multivariate F-tests

Test Name	Value	Approx.F	Hypoth.DF	Error DF	Sig.of F
Pillais	.76585	1.98575	42.00	570.00	.000 **
Hotellings	.93370	1.96374	42.00	530.00	.000 **
Wilks	.43013	1.99684	42.00	425.59	.000 **
Roys	.23384				

Univariate F-tests with (6,108) D. F.

Variables	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig.of F	
THEN	4.05	68.90	.68	.64	1.06	.392	
AFTER	13.87	162.20	2.31	1.50	1.54	.172	
WHILE	32.78	273.50	5.46	2.53	2.16	.053	
WHEN	6.98	160.40	1.16	1.49	.78	.585	
BEFORE	19.27	132.50	3.21	1.23	2.62	.021	*
UNTIL	18.68	207.10	3.11	1.92	1.62	.147	
TOGETHER	8.35	53.80	1.39	.50	2.79	.014	*

APPENDIX 13

Averaged F-test with (42,756) D. F.

VARIABLES	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F
1 to 7	103.98	1058.40	2.48	1.40	1.77

VARIABLES	Sig. of F
1 to 7	.002 **

EFFECT OF AGEGP

Multivariate F-tests

Test Name	Value	Approx.F	Hypoth.DF	Error DF	Sig.of F
Pillais	1.00588	6.62953	21.00	276.00	.000 **
Hotellings	2.59873	10.97240	21.00	266.00	.000 **
Wilks	.21978	8.57038	21.00	258.98	.000 **
Roys	.68939				

Univariate F-tests with (3,108) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig.of F
THEN	64.63	68.90	21.54	.64	33.77	.000 **
AFTER	83.23	162.20	27.74	1.50	18.47	.000 **
WHILE	153.69	273.50	51.23	2.53	20.23	.000 **
WHEN	122.17	160.40	40.72	1.49	27.42	.000 **
BEFORE	121.76	132.50	40.59	1.23	33.08	.000 **
UNTIL	71.29	207.10	23.76	1.92	12.39	.000 **
TOGETHER	40.20	53.80	13.40	.50	26.90	.000 **

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APPENDIX 13

Univariate F-tests with (2,108) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig.of F
THEN	8.75	68.90	4.38	.64	6.86	.002 **
AFTER	60.00	162.20	30.00	1.50	19.98	.000 **
WHILE	12.35	273.50	6.18	2.53	2.44	.092
WHEN	13.62	160.40	6.81	1.49	4.58	.012 *
BEFORE	12.07	132.50	6.03	1.23	4.92	.009 **
UNTIL	160.52	207.10	80.26	1.92	41.85	.000 **
TOGETHER	9.12	53.80	4.56	.50	9.15	.000 **

Averaged F-test with (14,756) D. F.

VARIABLES	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F
1 to 7	276.42	1058.40	19.74	1.40	14.10

VARIABLES	Sig. of F
1 to 7	.000 **

NEWMAN-KEUL ONEWAY ANALYSIS OF VARIANCE - LANGUAGE

SOURCE	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	PROB.
BETWEEN GROUPS	2	11.1867	5.5934	4.9821	.0084 **
WITHIN GROUPS	117	131.3541	1.1227		
TOTAL	119	142.5408			

STUDENT-NEWMAN-KEULS PROCEDURE RANGES FOR THE 0.050 LEVEL -
2.82 3.36
THE RANGES ABOVE ARE TABLE RANGES.
THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS..
0.7492 * RANGE * DSQRT(1/N(I) + 1/N(J))
(*) DENOTES PAIRS OF GROUPS SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

Mean	Group	G r p 2	G r p 1	G r p 3	
4.0679	Grp 2				(Grp 1=Lisu
4.5143	Grp 1				Grp 2=Thai Grp 3=English)
4.8107	Grp 3		*		

HOMOGENEOUS SUBSETS (SUBSETS OF GROUPS, WHOSE HIGHEST AND LOWEST MEANS DO NOT DIFFER BY MORE THAN THE SHORTEST SIGNIFICANT RANGE FOR A SUBSET OF THAT SIZE)

SUBSET 1		
GROUP	Grp 2	Grp 1
MEAN	4.0679	4.5143
SUBSET 2		
GROUP	Grp 1	Grp 3
MEAN	4.5143	4.8107

APPENDIX 13

NEWNAN-KEUL ONEWAY ANALYSIS OF VARIANCE - AGE GROUP

SOURCE	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROB.
BETWEEN GROUPS	3	85.8565	28.6188	58.5661	.0000 **
WITHIN GROUPS	116	56.6844	.4887		
TOTAL	119	142.5408			

STUDENT-NEWMAN-KEULS PROCEDURE RANGES FOR THE 0.050 LEVEL -
2.82 3.36 3.69
THE RANGES ABOVE ARE TABLE RANGES.
THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS..
0.4943 * RANGE * DSQRT(1/N(I) + 1/N(J))
(*) DENOTES PAIRS OF GROUPS SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

Mean	Group	Grp 1	Grp 2	Grp 3	Grp 4	
		1	2	3	4	
3.2905	Grp 1					Grp 1=Age group 1
4.1143	Grp 2	*				Grp 2=Age group 2
4.9095	Grp 3	*	*			Grp 3=Age group 3
5.5429	Grp 4	*	*	*		Grp 4=Age group 4

HOMOGENEOUS SUBSETS (SUBSETS OF GROUPS, WHOSE HIGHEST AND LOWEST MEANS DO NOT DIFFER BY MORE THAN THE SHORTEST SIGNIFICANT RANGE FOR A SUBSET OF THAT SIZE)

SUBSET 1
GROUP Grp 1
MEAN 3.2905
- - - - - - - - - - -
SUBSET 2
GROUP Grp 2
MEAN 4.1143
- - - - - - - - - - -
SUBSET 3
GROUP Grp 3
MEAN 4.9095
- - - - - - - - - - -
SUBSET 4
GROUP Grp 4
MEAN 5.5429

APPENDIX 14

MULTIFACTORIAL ANALYSIS OF VARIANCE FOR THE TOY TASK

Cell Means and Standard Deviations

Variable -"THEN"

FACTOR	CODE	Mean	Std. Dev.	N
LANGUAGE	1 - LISU			
AGEGP	1	2.700	.949	10
AGEGP	2	3.700	1.494	10
AGEGP	3	4.700	1.059	10
AGEGP	4	4.600	1.075	10
LANGUAGE	2 - THAI			
AGEGP	1	3.200	1.751	10
AGEGP	2	4.300	1.418	10
AGEGP	3	4.900	1.101	10
AGEGP	4	5.900	.316	10
LANGUAGE	3 - ENGLISH			
AGEGP	1	4.800	.919	10
AGEGP	2	5.500	.707	10
AGEGP	3	5.900	.316	10
AGEGP	4	5.800	.422	10
For entire sample		4.667	1.428	120

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LANGUAGE	3-ENGLISH			
AGEGP	1	4.600	1.174	10
AGEGP	2	4.100	2.132	10
AGEGP	3	5.600	.699	10
AGEGP	4	5.400	.699	10
For entire sample		3.842	1.734	120

Variable - "WHEN"

FACTOR	CODE		Mean	Std. Dev.	N
LANGUAGE		1-LISU			
AGEGP	1		3.200	2.044	10
AGEGP	2		3.700	1.636	10
AGEGP	3		3.100	2.331	10
AGEGP	4		4.700	1.703	10
LANGUAGE		2-THAI			
AGEGP	1		1.500	2.224	10
AGEGP	2		2.300	2.111	10
AGEGP	3		1.200	2.098	10
AGEGP	4		1.300	1.494	10
LANGUAGE		3-ENGLISH			
AGEGP	1		4.200	1.476	10
AGEGP	2		3.200	2.150	10
AGEGP	3		3.600	2.675	10
AGEGP	4		4.500	1.650	10
For entire sample			3.042	2.236	120

Variable - "BEFORE"

FACTOR	CODE		Mean	Std. Dev.	N
LANGUAGE		1-LISU			
AGEGP	1		2.100	1.101	10
AGEGP	2		3.600	1.506	10
AGEGP	3		3.900	1.524	10
AGEGP	4		4.500	1.080	10
LANGUAGE		2-THAI			
AGEGP	1		2.700	1.889	10
AGEGP	2		4.000	1.563	10
AGEGP	3		5.300	1.059	10
AGEGP	4		5.800	.422	10
LANGUAGE		3-ENGLISH			
AGEGP	1		3.300	2.214	10
AGEGP	2		4.500	1.434	10
AGEGP	3		5.400	1.075	10
AGEGP	4		5.800	.422	10
For entire sample			4.242	1.744	120

Variable - "UNTIL"

FACTOR	CODE		Mean	Std. Dev.	N
LANGUAGE		1-LISU			
AGEGP	1		1.500	1.509	10
AGEGP	2		3.100	1.729	10
AGEGP	3		4.300	1.494	10
AGEGP	4		5.100	1.197	10
LANGUAGE		2-THAI			
AGEGP	1		3.000	2.160	10
AGEGP	2		3.600	2.171	10
AGEGP	3		4.800	1.033	10
AGEGP	4		5.700	.949	10

LANGUAGE	3-ENGLISH			
AGEGP	1	4.100	1.370	10
AGEGP	2	4.600	1.506	10
AGEGP	3	5.100	1.370	10
AGEGP	4	5.800	.422	10
For entire sample		4.225	1.858	120

Variable - "TOGETHER"

FACTOR	CODE		Mean	Std. Dev.	N
LANGUAGE		1-LISU			
AGEGP	1		4.200	1.317	10
AGEGP	2		5.000	1.563	10
AGEGP	3		5.300	1.059	10
AGEGP	4		5.500	.707	10
LANGUAGE		2-THAI			
AGEGP	1		3.700	1.889	10
AGEGP	2		4.100	2.025	10
AGEGP	3		4.300	2.003	10
AGEGP	4		5.700	.675	10
LANGUAGE		3-ENGLISH			
AGEGP	1		5.400	.699	10
AGEGP	2		5.500	1.080	10
AGEGP	3		6.000	.000	10
AGEGP	4		5.600	.516	10
For entire sample			5.025	1.423	120

Variable - "SINCE"

FACTOR	CODE		Mean	Std. Dev.	N
LANGUAGE		1-LISU			
AGEGP	1		1.300	1.494	10
AGEGP	2		2.300	1.059	10
AGEGP	3		3.700	1.337	10
AGEGP	4		3.600	.843	10
LANGUAGE		2-THAI			
AGEGP	1		2.100	1.853	10
AGEGP	2		2.700	.823	10
AGEGP	3		3.200	.422	10
AGEGP	4		4.300	1.567	10
LANGUAGE		3-ENGLISH			
AGEGP	1		2.100	1.524	10
AGEGP	2		1.800	1.619	10
AGEGP	3		3.800	.919	10
AGEGP	4		3.900	1.449	10
For entire sample			2.900	1.558	120

ANALYSIS OF VARIANCE

(=significant at the 1% level of significance, *=significant at the 5% level of significance).**

EFFECT OF LANGUAGE BY AGEGP

Multivariate Tests of Significance (S = 6, M = 1/2, N = 49 1/2)

Test Name	Value	Approx. F	Hypoth DF	Error DF	Sig. of F
Pillais	.62535	1.54165	48.00	636.00	.013 *
Hotellings	.79342	1.64194	48.00	596.00	.005 **
Wilks	.49603	1.59850	48.00	501.02	.008 **
Roys	.29386				

APPENDIX 14

Univariate F-tests with (6,108) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig.of F
THEN	9.48	120.80	1.58	1.12	1.41	.216
AFTER	11.47	164.50	1.91	1.52	1.25	.285
WHILE	43.67	171.50	7.28	1.59	4.58	.000 **
WHEN	22.33	431.10	3.72	3.99	.93	.475
BEFORE	3.98	203.10	.66	1.88	.35	.907
UNTIL	12.52	238.30	2.09	2.21	.95	.466
TOGETHER	12.48	178.70	2.08	1.65	1.26	.283
SINCE	10.42	184.40	1.74	1.71	1.02	.418

Averaged F-test with (48,864) D. F.

VARIABLES	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F
1 to 8	126.35	1692.40	2.63	1.96	1.34

VARIABLES	Sig. of F
1 to 8	.063

EFFECT OF AGEGP

Multivariate Tests of Significance

Test Name	Value	Approx. F	Hypoth DF	Error DF	Sig. of F
Pillais	.61426	3.31498	24.00	309.00	.000 **
Hotellings	1.21133	5.03039	24.00	299.00	.000 **
Wilks	.43101	4.10730	24.00	293.53	.000 **
Roys	.52870				

Univariate F-tests with (3,108) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig.of F
THEN	62.27	120.80	20.76	1.12	18.56	.000 **
AFTER	72.56	164.50	24.19	1.52	15.88	.000 **
WHILE	66.36	171.50	22.12	1.59	13.93	.000 **
WHEN	11.49	431.10	3.83	3.99	.96	.415
BEFORE	122.29	203.10	40.76	1.88	21.68	.000 **
UNTIL	120.76	238.30	40.25	2.21	18.24	.000 **
TOGETHER	22.09	178.70	7.36	1.65	4.45	.005 **
SINCE	91.53	184.40	30.51	1.71	17.87	.000 **

Averaged F-test with (24,864) D. F.

VARIABLES	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F
1 to 8	569.35	1692.40	23.72	1.96	12.11

VARIABLES	Sig. of F
1 to 8	.000 **

APPENDIX 14

EFFECT OF LANGUAGE

Multivariate Tests of Significance

Test Name	Value	Approx. F	Hypoth DF	Error DF	Sig. of F
Pillais	.73774	7.45185	16.00	204.00	.000 **
Hotellings	1.18861	7.42884	16.00	200.00	.000 **
Wilks	.39586	7.44086	16.00	202.53	.000 **
Roys	.41847				

Univariate F-tests with (2,108) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig.of F
THEN	50.12	120.80	25.06	1.12	22.40	.000 **
AFTER	38.47	164.50	19.23	1.52	12.63	.000 **
WHILE	76.47	171.50	38.23	1.59	24.08	.000 **
WHEN	129.87	431.10	64.93	3.99	16.27	.000 **
BEFORE	32.62	203.10	16.31	1.88	8.67	.000 **
UNTIL	39.35	238.30	19.68	2.21	8.92	.000 **
TOGETHER	27.65	178.70	13.83	1.65	8.36	.000 **
SINCE	2.45	184.40	1.23	1.71	.72	.490

Averaged F-test with (16,864) D. F.

VARIABLES	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F
1 to 8	396.98	1692.40	24.81	1.96	12.67

VARIABLES	Sig. of F
1 to 8	.000 **

NEWMAN-KEUL ONEWAY ANALYSIS OF VARIANCE - LANGUAGE

SOURCE	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROB.
BETWEEN GROUPS	2	26.3375	13.1688	10.6126	.0001 **
WITHIN GROUPS	117	145.1812	1.2409		
TOTAL	119	171.5187			

STUDENT-NEWMAN-KEULS PROCEDURE RANGES FOR THE 0.050 LEVEL -
2.82 3.36
THE RANGES ABOVE ARE TABLE RANGES.
THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS..
0.7877 * RANGE * DSQRT(1/N(I) + 1/N(J))
(*) DENOTES PAIRS OF GROUPS SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

Mean	Group	Grp 2	Grp 1	Grp 3
3.6875	Grp 2			
3.7000	Grp 1			
4.6875	Grp 3	*	*	

(Grp 1=Lisu, Grp 2=Thai, Grp 3=English)

HOMOGENEOUS SUBSETS (SUBSETS OF GROUPS, WHOSE HIGHEST AND LOWEST MEANS DO NOT DIFFER BY MORE THAN THE SHORTEST SIGNIFICANT RANGE FOR A SUBSET OF THAT SIZE)

SUBSET 1
GROUP Grp 2 Grp 1
MEAN 3.6875 3.7000
- - - - - - - - - - - - - - - - - -
SUBSET 2
GROUP Grp 3
MEAN 4.6875

NEWMAN-KEUL ONEWAY ANALYSIS OF VARIANCE - AGE GROUP

SOURCE	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROB.
BETWEEN GROUPS	3	59.2531	19.7510	20.4080	.0000 **
WITHIN GROUPS	116	112.2656	.9678		
TOTAL	119	171.5187			

STUDENT-NEWMAN-KEULS PROCEDURE RANGES FOR THE 0.050 LEVEL -
2.82 3.36 3.69
THE RANGES ABOVE ARE TABLE RANGES.
THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS..
0.6956 * RANGE * DSQRT(1/N(I) + 1/N(J))
(*) DENOTES PAIRS OF GROUPS SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

Mean	Group	G r p 1	G r p 2	G r p 3	G r p 4
3.0458	Grp 1				
3.7458	Grp 2	*			
4.3833	Grp 3	* *			
4.9250	Grp 4	* * *			

(Grp 1=Age group 1,
Grp 2=Age group 2,
Grp 3=Age group 3,
Grp 4=Age group 4)

HOMOGENEOUS SUBSETS (SUBSETS OF GROUPS, WHOSE HIGHEST AND LOWEST MEANS DO NOT DIFFER BY MORE THAN THE SHORTEST SIGNIFICANT RANGE FOR A SUBSET OF THAT SIZE)

SUBSET 1
GROUP Grp 1
MEAN 3.0458
- - - - - - - - - - -
SUBSET 2
GROUP Grp 2
MEAN 3.7458
- - - - - - - - - - -
SUBSET 3
GROUP Grp 3
MEAN 4.3833
- - - - - - - - - - -
SUBSET 4
GROUP Grp 4
MEAN 4.9250
- - - - - - - - - - -

APPENDIX 15

MULTIFACTORIAL ANALYSIS OF VARIANCE FOR THE ELICITED IMITATION TASK

Cell Means and Standard Deviations

Variable - THEN

FACTOR	CODE	Mean	Std. Dev.	N
LANGUAGE	1 - LISU			
AGEGP	1	12.700	6.111	10
AGEGP	2	20.600	4.142	10
AGEGP	3	23.100	1.449	10
AGEGP	4	23.600	3.534	10
LANGUAGE	2 - THAI			
AGEGP	1	13.700	7.875	10
AGEGP	2	19.600	6.096	10
AGEGP	3	23.000	2.494	10
AGEGP	4	25.100	1.370	10
LANGUAGE	3 - ENGLISH			
AGEGP	1	17.200	4.367	10
AGEGP	2	19.200	4.662	10
AGEGP	3	20.800	6.443	10
AGEGP	4	20.200	4.467	10
For entire sample		19.900	5.876	120

Variable - AFTER

FACTOR	CODE	Mean	Std. Dev.	N
LANGUAGE	1 - LISU			
AGEGP	1	10.700	4.692	10
AGEGP	2	17.500	7.276	10
AGEGP	3	20.400	6.222	10
AGEGP	4	24.400	3.565	10
LANGUAGE	2 - THAI			
AGEGP	1	8.300	2.263	10
AGEGP	2	10.700	3.592	10
AGEGP	3	15.500	5.543	10
AGEGP	4	17.000	4.853	10
LANGUAGE	3 - ENGLISH			
AGEGP	1	16.600	7.806	10
AGEGP	2	20.000	6.218	10
AGEGP	3	21.600	6.381	10
AGEGP	4	24.600	3.836	10
For entire sample		17.275	7.273	120

Variable - WHEN

FACTOR	CODE	Mean	Std. Dev.	N
LANGUAGE	1 - LISU			
AGEGP	1	13.100	6.871	10
AGEGP	2	17.900	6.822	10
AGEGP	3	15.500	5.720	10
AGEGP	4	24.000	5.637	10
LANGUAGE	2 - THAI			
AGEGP	1	10.300	5.208	10
AGEGP	2	17.800	6.268	10
AGEGP	3	21.200	6.321	10
AGEGP	4	21.300	5.122	10

LANGUAGE	3 - ENGLISH			
AGEGP	1	17.200	7.285	10
AGEGP	2	19.100	5.216	10
AGEGP	3	21.800	4.826	10
AGEGP	4	19.700	4.855	10
For entire sample		18.242	6.745	120

Variable - BEFORE

FACTOR	CODE	Mean	Std. Dev.	N
LANGUAGE	1 - LISU			
AGEGP	1	10.000	3.682	10
AGEGP	2	19.100	4.040	10
AGEGP	3	16.000	3.944	10
AGEGP	4	21.200	3.584	10
LANGUAGE	2 - THAI			
AGEGP	1	11.300	5.293	10
AGEGP	2	20.500	7.948	10
AGEGP	3	21.000	5.617	10
AGEGP	4	25.400	3.627	10
LANGUAGE	3 - ENGLISH			
AGEGP	1	17.100	7.400	10
AGEGP	2	20.300	6.360	10
AGEGP	3	25.400	3.098	10
AGEGP	4	24.000	3.333	10
For entire sample		19.275	6.803	120

Variable - TOGETHER

FACTOR	CODE	Mean	Std. Dev.	N
LANGUAGE	1 - LISU			
AGEGP	1	7.900	3.510	10
AGEGP	2	12.400	6.077	10
AGEGP	3	18.000	5.457	10
AGEGP	4	20.000	3.333	10
LANGUAGE	2 - THAI			
AGEGP	1	9.000	3.651	10
AGEGP	2	14.700	8.138	10
AGEGP	3	19.200	4.211	10
AGEGP	4	19.900	3.985	10
LANGUAGE	3 - ENGLISH			
AGEGP	1	15.500	6.737	10
AGEGP	2	18.700	6.550	10
AGEGP	3	23.900	5.507	10
AGEGP	4	24.800	2.530	10
For entire sample		17.000	7.134	120

Variable - SINCE

FACTOR	CODE	Mean	Std. Dev.	N
LANGUAGE	1 - LISU			
AGEGP	1	8.300	4.347	10
AGEGP	2	16.400	8.592	10
AGEGP	3	17.400	6.899	10
AGEGP	4	20.700	6.201	10
LANGUAGE	2 - THAI			
AGEGP	1	8.400	1.897	10
AGEGP	2	12.000	6.360	10
AGEGP	3	14.900	5.820	10
AGEGP	4	17.400	3.098	10

LANGUAGE	3 - ENGLISH			
AGEGP	1	12.300	3.974	10
AGEGP	2	15.600	5.420	10
AGEGP	3	19.300	7.304	10
AGEGP	4	20.900	6.691	10
For entire sample		15.300	6.933	120

Variable .. CONN7 - UNTIL

FACTOR	CODE	Mean	Std. Dev.	N
LANGUAGE	1 - LISU			
AGEGP	1	13.800	6.877	10
AGEGP	2	21.600	4.033	10
AGEGP	3	23.100	4.202	10
AGEGP	4	24.000	3.432	10
LANGUAGE	2 - THAI			
AGEGP	1	9.200	3.360	10
AGEGP	2	13.400	5.211	10
AGEGP	3	14.200	6.697	10
AGEGP	4	15.200	4.442	10
LANGUAGE	3 - ENGLISH			
AGEGP	1	16.000	7.165	10
AGEGP	2	18.300	6.499	10
AGEGP	3	18.700	5.908	10
AGEGP	4	21.400	5.254	10
For entire sample		17.408	6.751	120

ANALYSIS OF VARIANCE

(=significant at the 1% level of significance, *=significant at the 5% level of significance).**

EFFECT OF LANGUAGE BY AGEGP

Multivariate Tests of Significance

Test Name	Value	Approx.F	Hypoth.DF	Error DF	Sig. of F
Pillais	.53426	1.49414	42.00	642.00	.025 *
Hotellings	.65461	1.56379	42.00	602.00	.015 *
Wilks	.55469	1.53610	42.00	481.87	.019 *
Roys	.25893				

Univariate F-tests with (6,108) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
THEN	261.33	2507.60	43.56	23.22	1.88	.091
AFTER	130.55	3183.30	21.76	29.48	.74	.620
WHEN	499.98	3761.90	83.33	34.83	2.39	.033 *
BEFORE	301.28	2790.90	50.21	25.84	1.94	.080
TOGETHER	34.15	2955.00	5.69	27.36	.21	.974
SINCE	82.55	3686.20	13.76	34.13	.40	.876
UNTIL	138.12	3168.70	23.02	29.34	.78	.584

Averaged F-test with (42,756) D. F.

VARIABLES	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F
1 to 7	1447.97	22053.60	34.48	29.17	1.18

VARIABLES	Sig. of F
1 to 7	.203

APPENDIX 15

EFFECT OF AGEGP

Multivariate Tests of Significance

Test Name	Value	Approx.F	Hypoth.DF	Error DF	Sig. of F
Pillais	.67023	4.27408	21.00	312.00	.000 **
Hotellings	1.17990	5.65601	21.00	302.00	.000 **
Wilks	.41897	4.94479	21.00	293.44	.000 **
Roys	.49527				

Univariate F-tests with (3,108) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
THEN	1319.27	2507.60	439.76	23.22	18.94	.000 **
AFTER	1698.43	3183.30	566.14	29.48	19.21	.000 **
WHEN	1064.49	3761.90	354.83	34.83	10.19	.000 **
BEFORE	1885.89	2790.90	628.63	25.84	24.33	.000 **
TOGETHER	2209.00	2955.00	736.33	27.36	26.91	.000 **
SINCE	1644.40	3686.20	548.13	34.13	16.06	.000 **
UNTIL	868.16	3168.70	289.39	29.34	9.86	.000 **

Averaged F-test with (21,756) D. F.

VARIABLES	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F
1 to 7	10689.63	22053.60	509.03	29.17	17.45

VARIABLES	Sig. of F
1 to 7	.000 **

EFFECT OF LANGUAGE

Multivariate Tests of Significance

Test Name	Value	Approx.F	Hypoth.DF	Error DF	Sig. of F
Pillais	.96671	13.76615	14.00	206.00	.000 **
Hotellings	1.92158	13.86281	14.00	202.00	.000 **
Wilks	.26349	13.81569	14.00	204.00	.000 **
Roys	.54195				

Univariate F-tests with (2,108) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
THEN	20.60	2507.60	10.30	23.22	.44	.643
AFTER	1281.65	3183.30	640.83	29.48	21.74	.000 **
WHEN	87.62	3761.90	43.81	34.83	1.26	.288
BEFORE	529.85	2790.90	264.93	25.84	10.25	.000 **
TOGETHER	857.85	2955.00	428.93	27.36	15.68	.000 **
SINCE	306.05	3686.20	153.03	34.13	4.48	.013 *
UNTIL	1248.02	3168.70	624.01	29.34	21.27	.000 **

APPENDIX 15

Averaged F-test with (14,756) D. F.

VARIABLES	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F
1 to 7	4331.63	22053.60	309.40	29.17	10.61

VARIABLES	Sig. of F
1 to 7	.000 **

NEWMAN-KEULS ONEWAY ANALYSIS OF VARIANCE - LANGUAGE

SOURCE	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROB.
BETWEEN GROUPS	2	261.58	130.79	4.40	.0143
WITHIN GROUPS	117	3474.76	29.70		
TOTAL	119	3736.34			

STUDENT-NEWMAN-KEULS PROCEDURE RANGES FOR THE 0.050 LEVEL -
2.82 3.36
THE RANGES ABOVE ARE TABLE RANGES.
THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS..
3.8535 * RANGE * DSQRT(1/N(I) + 1/N(J))
(*) DENOTES PAIRS OF GROUPS SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

Mean	Group	G r p 2	G r p 1	G r p 3	
16.0429	Grp 2				(Grp 1=Lisu, Grp 2=Thai,
17.6214	Grp 1				Grp 3=English)
19.6500	Grp 3	*			

HOMOGENEOUS SUBSETS (SUBSETS OF GROUPS, WHOSE HIGHEST AND LOWEST MEANS DO NOT DIFFER BY MORE THAN THE SHORTEST SIGNIFICANT RANGE FOR A SUBSET OF THAT SIZE)

SUBSET 1

GROUP	Grp 2	Grp 1
MEAN	16.0429	17.6214

SUBSET 2

GROUP	Grp 1	Grp 3
MEAN	17.6214	19.6500

NEWMAN-KEUL ONEWAY ANALYSIS OF VARIANCE - AGEGP

SOURCE	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROB.
BETWEEN GROUPS	3	1463.76	487.92	24.90	.0000 **
WITHIN GROUPS	116	2272.59	19.59		
TOTAL	119	3736.34			

STUDENT-NEWMAN-KEULS PROCEDURE RANGES FOR THE 0.050 LEVEL -
2.82 3.36 3.69
THE RANGES ABOVE ARE TABLE RANGES.

APPENDIX 15

THE VALUE ACTUALLY COMPARED WITH MEAN(J)-MEAN(I) IS..
3.1298 * RANGE * DSQRT(1/N(I) + 1/N(J))
(*) DENOTES PAIRS OF GROUPS SIGNIFICANTLY DIFFERENT AT THE 0.050 LEVEL

Mean	Group	G r p 1	G r p 2	G r p 3	G r p 4
12.3143	Grp 1				
17.4000	Grp 2	*			
19.7143	Grp 3	*	*		
21.6571	Grp 4	*	*		

(Grp 1=Age group 1,
Grp 2=Age group 2,
Grp 3=Age group 3,
Grp 4=Age group 4)

HOMOGENEOUS SUBSETS (SUBSETS OF GROUPS, WHOSE HIGHEST AND LOWEST MEANS DO NOT DIFFER BY MORE THAN THE SHORTEST SIGNIFICANT RANGE FOR A SUBSET OF THAT SIZE)

SUBSET	1		
GROUP	Grp 1		
MEAN	12.3143		
SUBSET	2		
GROUP	Grp 2		
MEAN	17.4000		
SUBSET	3		
GROUP	Grp 3	Grp 4	
MEAN	19.7143	21.6571	

MULTIFACTORIAL ANALYSIS OF VARIANCE FOR THE ELICITED IMITATION TASK WITH AND WITHOUT PROGRESSIVE ASPECT MARKERS (PAM).
(ASPECT 1=WITHOUT PROGRESSIVE ASPECT MARKER, ASPECT 2=WITH PROGRESSIVE ASPECT MARKER)

Cell Means and Standard Deviations

Variable .. CONN1 - THEN

FACTOR	CODE	Mean	Std. Dev.	N
AGEGP	1			
LANG	1 - LISU			
ASPECT	1	12.700	6.111	10
ASPECT	2	12.000	5.249	10
LANG	2 - THAI			
ASPECT	1	13.700	7.675	10
ASPECT	2	10.700	5.397	10
LANG	3 - ENGLISH			
ASPECT	1	17.200	4.367	10
ASPECT	2	15.100	3.900	10
AGEGP	2			
LANG	1 - LISU			
ASPECT	1	20.600	4.142	10
ASPECT	2	17.900	6.367	10
LANG	2 - THAI			
ASPECT	1	19.600	6.096	10
ASPECT	2	15.900	5.877	10
LANG	3 - ENGLISH			
ASPECT	1	19.200	4.662	10
ASPECT	2	18.200	5.245	10
AGEGP	3			
LANG	1 - LISU			
ASPECT	1	23.100	1.449	10
ASPECT	2	20.100	3.107	10
LANG	2 - THAI			
ASPECT	1	23.000	2.494	10
ASPECT	2	20.200	3.765	10
LANG	3 - ENGLISH			
ASPECT	1	20.800	6.443	10
ASPECT	2	19.300	5.889	10
AGEGP	4			
LANG	1 - LISU			
ASPECT	1	23.600	3.534	10
ASPECT	2	23.400	3.098	10
LANG	2 - THAI			
ASPECT	1	25.100	1.370	10
ASPECT	2	19.900	3.247	10
LANG	3 - ENGLISH			
ASPECT	1	20.200	4.467	10
ASPECT	2	19.200	3.011	10
For entire sample		18.779	5.968	240

- - - -

LANG	3			
ASPECT	1	16.600	7.806	10
ASPECT	2	17.700	7.258	10
AGEGP	2			
LANG	1			
ASPECT	1	17.500	7.276	10
ASPECT	2	17.400	7.168	10
LANG	2			
ASPECT	1	10.700	3.592	10
ASPECT	2	10.700	2.584	10
LANG	3			
ASPECT	1	20.000	6.218	10
ASPECT	2	18.300	6.897	10
AGEGP	3			
LANG	1			
ASPECT	1	20.400	6.222	10
ASPECT	2	16.500	4.673	10
LANG	2			
ASPECT	1	15.500	5.543	10
ASPECT	2	11.900	3.281	10
LANG	3			
ASPECT	1	21.600	6.381	10
ASPECT	2	22.600	5.522	10
AGEGP	4			
LANG	1			
ASPECT	1	24.400	3.565	10
ASPECT	2	21.600	4.248	10
LANG	2			
ASPECT	1	17.000	4.853	10
ASPECT	2	14.400	4.274	10
LANG	3			
ASPECT	1	24.600	3.836	10
ASPECT	2	24.400	4.115	10
For entire sample		16.671	7.120	240

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Variable .. CONN3 - WHEN

FACTOR	CODE	Mean	Std. Dev.	N
AGEGP	1			
LANG	1			
ASPECT	1	13.100	6.871	10
ASPECT	2	9.700	3.773	10
LANG	2			
ASPECT	1	10.300	5.208	10
ASPECT	2	7.700	2.710	10
LANG	3			
ASPECT	1	17.200	7.285	10
ASPECT	2	15.300	6.038	10
AGEGP	2			
LANG	1			
ASPECT	1	17.900	6.822	10
ASPECT	2	16.600	5.481	10
LANG	2			
ASPECT	1	17.800	6.268	10
ASPECT	2	12.400	3.748	10
LANG	3			
ASPECT	1	19.100	5.216	10
ASPECT	2	20.900	5.322	10
AGEGP	3			
LANG	1			
ASPECT	1	15.500	5.720	10

ASPECT	2	15.800	6.529	10
LANG	2			
ASPECT	1	21.200	6.321	10
ASPECT	2	18.700	6.056	10
LANG	3			
ASPECT	1	21.800	4.826	10
ASPECT	2	22.900	3.957	10
AGEGP	4			
LANG	1			
ASPECT	1	24.000	5.637	10
ASPECT	2	22.600	5.147	10
LANG	2			
ASPECT	1	21.300	5.122	10
ASPECT	2	17.600	4.248	10
LANG	3			
ASPECT	1	19.700	4.855	10
ASPECT	2	23.700	3.830	10
For entire sample		17.617	6.771	240

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Variable .. CONN4 - BEFORE

FACTOR	CODE	Mean	Std. Dev.	N
AGEGP	1			
LANG	1			
ASPECT	1	10.000	3.682	10
ASPECT	2	8.100	3.107	10
LANG	2			
ASPECT	1	11.300	5.293	10
ASPECT	2	10.100	5.384	10
LANG	3			
ASPECT	1	17.100	7.400	10
ASPECT	2	15.900	5.507	10
AGEGP	2			
LANG	1			
ASPECT	1	18.100	5.363	10
ASPECT	2	13.700	4.785	10
LANG	2			
ASPECT	1	20.500	7.948	10
ASPECT	2	13.100	4.864	10
LANG	3			
ASPECT	1	20.300	6.360	10
ASPECT	2	17.300	6.897	10
AGEGP	3			
LANG	1			
ASPECT	1	16.000	3.944	10
ASPECT	2	14.900	4.067	10
LANG	2			
ASPECT	1	21.000	5.617	10
ASPECT	2	16.500	4.353	10
LANG	3			
ASPECT	1	25.400	3.098	10
ASPECT	2	22.900	5.021	10
AGEGP	4			
LANG	1			
ASPECT	1	21.200	3.584	10
ASPECT	2	17.400	5.275	10
LANG	2			
ASPECT	1	25.400	3.627	10
ASPECT	2	18.900	5.446	10
LANG	3			
ASPECT	1	24.000	3.333	10

ASPECT	2	23.800	3.967	10
For entire sample		17.621	6.854	240

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Variable .. CONN5 - TOGETHER

FACTOR	CODE	Mean	Std. Dev.	N
AGEGP	1			
LANG	1			
ASPECT	1	7.900	3.510	10
ASPECT	2	7.400	3.373	10
LANG	2			
ASPECT	1	9.000	3.651	10
ASPECT	2	8.200	3.048	10
LANG	3			
ASPECT	1	15.500	6.737	10
ASPECT	2	14.600	5.621	10
AGEGP	2			
LANG	1			
ASPECT	1	12.400	6.077	10
ASPECT	2	11.500	6.151	10
LANG	2			
ASPECT	1	14.700	8.138	10
ASPECT	2	12.700	5.982	10
LANG	3			
ASPECT	1	18.700	6.550	10
ASPECT	2	17.900	7.094	10
AGEGP	3			
LANG	1			
ASPECT	1	18.000	5.457	10
ASPECT	2	17.100	5.527	10
LANG	2			
ASPECT	1	19.200	4.211	10
ASPECT	2	17.600	3.921	10
LANG	3			
ASPECT	1	23.900	5.507	10
ASPECT	2	20.800	7.208	10
AGEGP	4			
LANG	1			
ASPECT	1	20.000	3.333	10
ASPECT	2	19.200	3.155	10
LANG	2			
ASPECT	1	19.900	3.985	10
ASPECT	2	18.600	3.565	10
LANG	3			
ASPECT	1	24.800	2.530	10
ASPECT	2	23.800	4.541	10
For entire sample		16.392	7.014	240

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ANALYSIS OF VARIANCE
EFFECT OF AGEGP BY LANG BY ASPECT
Multivariate Tests of Significance (S = 5, M = 0, N = 105)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	.09292	.68167	30.00	1080.00	.902
Hotellings	.09696	.68000	30.00	1052.00	.904
Wilks	.90946	.68026	30.00	850.00	.903
Roys	.05631				

Univariate F-tests with (6,216) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F

CONN1 THEN	48.57500	4867.50000	8.09583	22.53472	.35926	.904
CONN2 AFTER	71.85833	5795.10000	11.97639	26.82917	.44639	.847
CONN3 WHEN	96.43333	6263.40000	16.07222	28.99722	.55427	.766
CONN4 BEFORE	76.95833	5575.90000	12.82639	25.81435	.49687	.810
CONN5 TOGETH	12.27500	5811.40000	2.04583	26.90463	.07604	.998

Averaged F-test with (30,1080) D. F.

VARIABLES	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F
1 to 5	306.10000	28313.30000	10.20333	26.21602	.38920

VARIABLES	Sig. of F
1 to 5	.999

EFFECT OF LANG BY ASPECT

Multivariate Tests of Significance (S = 2, M = 1 , N = 105)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	.07850	1.74038	10.00	426.00	.070
Hotellings	.08298	1.75098	10.00	422.00	.068
Wilks	.92247	1.74574	10.00	424.00	.069
Roys	.06304				

Note.. F statistic for WILK'S Lambda is exact.

Univariate F-tests with (2,216) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
CONN1 THEN	62.25833	4867.50000	31.12917	22.53472	1.38139	.253
CONN2 AFTER	49.30833	5795.10000	24.65417	26.82917	.91893	.400
CONN3 WHEN	231.60000	6263.40000	115.80000	28.99722	3.99349	.020
CONN4 BEFORE	104.30833	5575.90000	52.15417	25.81435	2.02036	.135
CONN5 TOGETH	5.85833	5811.40000	2.92917	26.90463	.10887	.897

Averaged F-test with (10,1080) D. F.

VARIABLES	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F
1 to 5	453.33333	28313.30000	45.33333	26.21602	1.72922

VARIABLES	Sig. of F
1 to 5	.070

- -

EFFECT OF AGEGP BY ASPECT

Multivariate Tests of Significance (S = 3, M = 1/2, N = 105)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	.06797	.99212	15.00	642.00	.462
Hotellings	.07029	.98720	15.00	632.00	.467
Wilks	.93322	.98984	15.00	585.64	.464
Roys	.03665				

Univariate F-tests with (3,216) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
CONN1 THEN	2.91250	4867.50000	.97083	22.53472	.04308	.988
CONN2 AFTER	41.07917	5795.10000	13.69306	26.82917	.51038	.676
CONN3 WHEN	54.31667	6263.40000	18.10556	28.99722	.62439	.600
CONN4 BEFORE	96.77917	5575.90000	32.25972	25.81435	1.24968	.293
CONN5 TOGETH	10.35000	5811.40000	3.45000	26.90463	.12823	.943

Averaged F-test with (15,1080) D. F.

VARIABLES	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F
1 to 5	205.43750	28313.30000	13.69583	26.21602	.52242

VARIABLES	Sig. of F
1 to 5	.929

- -

EFFECT OF AGEGP BY LANG
Multivariate Tests of Significance (S = 5, M = 0, N = 105)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	.31756	2.44146	30.00	1080.00	.000
Hotellings	.35049	2.45807	30.00	1052.00	.000
Wilks	.71649	2.46272	30.00	850.00	.000
Roys	.13117				

Univariate F-tests with (6,216) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
CONN1 THEN	391.14167	4867.50000	65.19028	22.53472	2.89288	.010
CONN2 AFTER	260.42500	5795.10000	43.40417	26.82917	1.61780	.143
CONN3 WHEN	630.26667	6263.40000	105.04444	28.99722	3.62257	.002
CONN4 BEFORE	256.94167	5575.90000	42.82361	25.81435	1.65891	.132
CONN5 TOGETH	71.25833	5811.40000	11.87639	26.90463	.44143	.851

Averaged F-test with (30,1080) D. F.

VARIABLES	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F
1 to 5	1610.03333	28313.30000	53.67778	26.21602	2.04714

VARIABLES	Sig. of F
1 to 5	.001

- -

EFFECT OF ASPECT
Multivariate Tests of Significance (S = 1, M = 1 1/2, N = 105)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.12066	5.81805	5.00	212.00	.000
Hotellings	.13722	5.81805	5.00	212.00	.000
Wilks	.87934	5.81805	5.00	212.00	.000
Roys	.12066				

Note.. F statistics are exact.

Univariate F-tests with (1,216) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
CONN1 THEN	301.50417	4867.50000	301.50417	22.53472	13.37954	.000
CONN2 AFTER	87.60417	5795.10000	87.60417	26.82917	3.26526	.072
CONN3 WHEN	93.75000	6263.40000	93.75000	28.99722	3.23307	.074
CONN4 BEFORE	592.20417	5575.90000	592.20417	25.81435	22.94089	.000
CONN5 TOGETH	88.81667	5811.40000	88.81667	26.90463	3.30117	.071

Averaged F-test with (5,1080) D. F.

VARIABLES	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F
1 to 5	1163.87917	28313.30000	232.77583	26.21602	8.87915

VARIABLES	Sig. of F
1 to 5	.000

- -

EFFECT OF LANG
Multivariate Tests of Significance (S = 2, M = 1 , N = 105)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	.75947	26.08059	10.00	426.00	.000

Hotellings	1.25221	26.42158	10.00	422.00	.000
Wilks	.38144	26.25184	10.00	424.00	.000
Roys	.43705				

Note.. F statistic for WILK'S Lambda is exact.

Univariate F-tests with (2,216) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
CONN1 THEN	19.55833	4867.50000	9.77917	22.53472	.43396	.649
CONN2 AFTER	3038.40833	5795.10000	1519.20417	26.82917	56.62510	.000
CONN3 WHEN	767.23333	6263.40000	383.61667	28.99722	13.22943	.000
CONN4 BEFOR	1430.85833	5575.90000	715.42917	25.81435	27.71440	.000
CONN5 TOGET	1588.00833	5811.40000	794.00417	26.90463	29.51180	.000

Averaged F-test with (10,1080) D. F.

VARIABLES	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F
1 to 5	6844.06667	28313.30000	684.40667	26.21602	26.10643

VARIABLES	Sig. of F
1 to 5	.000

- -

EFFECT OF AGEGP

Multivariate Tests of Significance (S = 3, M = 1/2, N = 105)

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillais	.54388	9.47765	15.00	642.00	.000
Hotellings	.95154	13.36387	15.00	632.00	.000
Wilks	.49357	11.37945	15.00	585.64	.000
Roys	.46504				

Univariate F-tests with (3,216) D. F.

Variable	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F	Sig. of F
CONN1 THEN	2535.84583	4867.50000	845.28194	22.53472	37.51020	.000
CONN2 AFTER	2771.21250	5795.10000	923.73750	26.82917	34.43035	.000
CONN3 WHEN	2821.73333	6263.40000	940.57778	28.99722	32.43682	.000
CONN4 BEFOR	3092.54583	5575.90000	1030.84861	25.81435	39.93316	.000
CONN5 TOGET	4169.21667	5811.40000	1389.73889	26.90463	51.65427	.000

Averaged F-test with (15,1080) D. F.

VARIABLES	Hypoth. SS	Error SS	Hypoth. MS	Error MS	F
1 to 5	15390.55417	28313.30000	1026.03694	26.21602	39.13779

VARIABLES	Sig. of F
1 to 5	.000

- -

APPENDIX 17

Marble task - The effect of language for connective.

Newman-Keul Oneway Analysis of Variance for Language by Connective.

(*=significant at the 5% level of significance,**=significant at the 1% level of significance).

Variable: Conn 1. Then
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	8.7500	4.3750	3.7207	.0271 *
Within Groups	117	137.5750	1.1759		
Total	119	146.3250			

Group

Mean	Group	2 1 3
4.6750	2	
4.8000	1	
5.3000	3	* *

(* Denotes pairs of groups significantly different at the 0.05 level.)

	Subset 1		Subset 2
Group	Group 2	Group 1	Group 3
Mean	4.6750	4.8000	5.3000

Homogeneous Subsets (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

Variable: Conn 2. After
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	60.0000	30.0000	13.5364	.0000**
Within Groups	117	259.3000	2.2162		
Total	119	319.3000			

Group

Mean	Group	2 1 3
3.6500	2	
5.1500	1	*
5.1500	3	*

(* Denotes pairs of groups significantly different at the 0.05 level.)

	Subset 1	Subset 2	
Group	Group 2	Group 1	Group 3
Mean	3.6500	5.1500	5.1500

Homogeneous Subsets (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

Variable: Conn 3. While
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	12.3500	6.1750	1.5707	.2123
Within Groups	117	459.9750	3.9314		
Total	119	472.3250			

No two groups are significantly different at the 0.05 level.

Variable: Conn 4. When
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	13.6167	6.8083	2.7511	.0680
Within Groups	117	289.5500	2.4748		
Total	119	303.1667			

Oneway Analysis: No two groups are significantly different at the 0.05 level.

	Subset 1		
Group	Group 3	Group 1	Group 2
Mean	3.5000	3.9250	4.3250

Homogeneous Subsets (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

Variable Conn 5: Before
By Variable language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	12.0667	6.0333	2.5808	.0800
Within Groups	117	273.5250	2.3378		
Total	119	285.5917			

One way Analysis: No two groups are significantly different at the 0.05 level.

Variable Conn 5: Before
By Variable language

	Subset 1		
Group	Group 2	Group 1	Group 3
Mean	4.3750	4.5750	5.1250

Homogeneous Subsets (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

Variable Conn 6: Until
By Variable language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	160.5167	80.2583	31.6089	.0000 **
Within Groups	117	297.0750	2.5391		
Total	119	457.5917			

One way Analysis: Pairs of groups are significantly different at the 0.05 level.

Group

Mean	Group	2 3 1
2.6750	2	
5.0500	3	*
5.2000	1	*

(* Denotes pairs of groups significantly different at the 0.05 level.)

	Subset 1	Subset 2	
Group	Group 2	Group 3	Group 1
Mean	2.6750	5.0500	5.2000

Homogeneous Subsets (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

APPENDIX 17

Variable Conn 7: Together
By Variable language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	9.1167	4.5583	5.2108	.0068 **
Within Groups	117	102.3500	0.8748		
Total	119	111.4667			

One way Analysis: Pairs of groups are significantly different at the 0.05 level.

Group

Mean	Group	1 2 3
5.1000	1	
5.4250	2	
5.7750	3	*

(* Denotes pairs of groups significantly different at the 0.05 level.)

	Subset 1		Subset 2	
Group	Group 1	Group 2	Group 2	Group 3
Mean	5.1000	5.4250	5.4250	5.7750

Homogeneous Subsets (Subsets of Groups, whose highest an lowest means do not differ by more than the shortest significant range for a subject of that size)

APPENDIX 18

Toy Task - The effect of language on connective.

Newman-Keul Oneway Analysis of Variance for Language by Connective.

Variable: Conn 1. Then
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	50.1167	25.0583	15.2263	.0000 **
Within Groups	117	192.5500	1.6457		
Total	119	242.6667			

Multiple Range Test. Student Newman Keuls Procedure.

Group

Mean	Group	1 2 3
3.9250	1	
4.5750	2	*
5.5000	3	* *

(* Denotes pairs of groups significantly different at the 0.05 level.)

	Subset 1	Subset 2	Subset 3
Group	Group 1	Group 2	Group 3
Mean	3.9250	4.5750	5.5000

Homogeneous Subsets (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

Variable: Conn 2. After
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	38.4667	19.2333	9.0546	.0002 **
Within Groups	117	248.5250	2.1241		
Total	119	286.9917			

Multiple Range Test. Student Newman Keuls Procedure.

Group

Mean	Group	1 2 3
3.6750	1	
4.0750	2	
5.0250	3	* *

(* Denotes pairs of groups significantly different at the 0.05 level.)

	Subset 1		Subset 2
Group	Group 1	Group 2	Group 3
Mean	3.6750	4.0750	5.0250

Homogeneous Subsets (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

Variable: Conn 3. While
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	76.4667	38.2333	15.8895	.0000**
Within Groups	117	281.5250	2.4062		
Total	119	357.9917			

APPENDIX 18

Multiple Range Test. Student Newman Keuls Procedure.

Group

Mean	Group	2 1 3
3.0250	2	
3.5750	1	
4.9250	3	* *

(* Denotes pairs of groups significantly different at the 0.05 level.)

	Subset 1		Subset 2
Group	Group 2	Group 1	Group 3
Mean	3.0250	3.5750	4.9250

Homogeneous Subsets (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

Variable: Conn 4. When
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	129.8667	64.9333	16.3407	.0000**
Within Groups	117	464.9250	3.9737		
Total	119	594.7917			

Multiple Range Test. Student Newman Keuls Procedure.

Group

Mean	Group	2 1 3
1.5750	2	
3.6750	1	*
3.8750	3	*

(* Denotes pairs of groups significantly different at the 0.05 level.)

APPENDIX 18

	Subset 1	Subset 2	
Group	Group 2	Group 1	Group 3
Mean	3.6750	1.5750	3.8750

Homogeneous Subsets (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

Variable: Conn 5. Before
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	32.6167	16.3083	5.7930	.0040**
Within Groups	117	329.3750	2.8152		
Total	119	361.9917			

Multiple Range Test. Student Newman Keuls Procedure.

Mean	Group	1 2 3
3.5250	1	
4.4500	2	*
4.7500	3	*

(* Denotes pairs of groups significantly different at the 0.05 level.)

	Subset 1	Subset 2	
Group	Group 1	Group 2	Group 3
Mean	3.5250	4.4500	4.7500

Homogeneous Subsets (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

Variable: Conn 6. Until
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	39.3500	19.6750	6.1952	.0028**
Within Groups	117	371.5750	3.1759		
Total	119	410.9250			

Multiple Range Test. Student Newman Keuls Procedure.

Mean	Group	1 2 3
3.5000	1	
4.2750	2	
4.9000	3	*

(* Denotes pairs of groups significantly different at the 0.05 level.)

	Subset 1		Subset 2	
Group	Group 1	Group 2	Group 2	Group 3
Mean	3.5000	4.2750	4.2750	4.9000

Homogeneous Subsets (Subsets of Groups, whose highest and lowest answer do not differ by more than the shortest significant range for a subject of that size)

Variable: Conn 7. Together
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	27.6500	13.8250	7.5842	.0008**
Within Groups	117	213.2750	1.8229		
Total	119	240.9250			

APPENDIX 18

Multiple Range Test. Student Newman Keuls Procedure.

Mean	Group	2 1 3
4.4500	2	
5.0000	1	
5.6250	3	* *

(* Denotes pairs of groups significantly different at the 0.05 level.)

	Subset 1		Subset 2
Group	Group 2	Group 1	Group 3
Mean	4.4500	5.0000	5.6250

Homogeneous Subsets (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

Variable: Conn 8. Since
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	2.4500	1.2250	0.5005	.6075
Within Groups	117	286.3500	2.4474		
Total	119	288.8000			

No significant difference at 0.05 level of significance.

Homogeneous Subsets: (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

	Subset 1		
Group	Group 1	Group 3	Group 2
Mean	2.7250	2.9000	3.0750

APPENDIX 19

Elicited Imitation Task - The effect of language on connective. Newman-Keuls oneway analysis of variance - connective by language.

Variable: Conn 1. Then
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	20.600	10.3000	0.2948	.7453
Within Groups	117	4088.2000	34.9419		
Total	119	4108.8000			

No significant difference at 0.05 level of significance.

Homogeneous Subsets: (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

No Two Groups are Significantly Different at the 0.05 level.

	Subset 1		
Group	Group 3	Group 1	Group 2
Mean	19.3500	20.0000	20.3500

Variable: Conn 2. After
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	1281.650	640.8250	14.9586	.0000**
Within Groups	117	5012.2750	42.8400		
Total	119	6293.9250			

APPENDIX 19

Multiple Range Test. Student Newman Keuls Procedure.

Mean	Group	2 1 3
12.875	2	
18.250	1	*
20.700	3	*

(* Denotes pairs of groups significantly different at the 0.05 level.)

	Subset 1	Subset 2	
Group	Group 2	Group 1	Group 3
Mean	12.8750	18.2500	20.7000

Homogeneous Subsets (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

Variable: Conn 3. When
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	87.6167	43.8083	0.9623	.3850
Within Groups	117	5326.3750	45.5246		
Total	119	5413.9917			

No Significant difference at the 0.05 significance level.

Multiple Range Test Newman Keuls Procedure.

	Subset 1		
Group	Group 1	Group 2	Group 3
Mean	17.6250	17.6500	19.4500

Homogeneous Subsets: (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

Variable: Conn 4. Before
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	529.8500	264.925	6.2265	.0027**
Within Groups	117	4978.0750	42.5476		
Total	119	5507.9250			

No Significant difference at the 0.05 significance level.

Multiple Range Test Newman Keuls Procedure.

Mean	Group	1 2 3
16.575	1	
19.550	2	*
21.700	3	*

(* Denotes pairs of groups significantly different at the 0.05 level.)

	Subset 1	Subset 2	
Group	Group 1	Group 2	Group 3
Mean	16.5750	19.550	21.700

Homogeneous Subsets: (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

Variable: Conn 5. Together
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	857.8500	428.9250	9.6542	.0001**
Within Groups	117	5198.1500	44.4286		
Total	119	6056.0000			

APPENDIX 19

Multiple Range Test. Student Newman Keuls Procedure.

Mean	Group	1 2 3
14.570	1	
15.700	2	
20.725	3	* *

(* Denotes pairs of groups significantly different at the 0.05 level.)

	Subset 1		Subset 2
Group	Group 1	Group 2	Group 3
Mean	14.5750	15.7000	20.7250

Homogeneous Subsets (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

Variable: Conn 6. Since
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	306.0500	153.0250	3.3075	.0401 *
Within Groups	117	5413.1500	46.2662		
Total	119	5719.2000			

Significant at the 0.05 level.

Mean	Group	2 1 3
13.175	2	
15.700	1	
17.025	3	*

(* Denotes pairs of groups significantly different at the 0.05 level.)

	Subset 1		Subset 2	
Group	Group 2	Group 1	Group 1	Group 3
Mean	13.1750	15.7000	15.7000	17.0250

Homogeneous Subsets (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

APPENDIX 19

Variable: Conn 7. Until
By Variable: language

Analysis of Variance

Source	D.F.	SUM OF SQUARES	MEAN SQUARES	F RATIO	F PROBABILITY
Between Groups	2	1248.0167	624.0083	17.4873	.0000**
Within Groups	117	4174.9750	35.6835		
Total	119	5422.9917			

Multiple Range Test. Student Newman Keuls Procedure.

Mean	Group	2 3 1
13.000	2	
18.600	3	*
20.625	1	*

(* Denotes pairs of groups significantly different at the 0.05 level.)

	Subset 1	Subset 2	
Group	Group 2	Group 3	Group 1
Mean	13.0000	18.6000	20.6250

Homogeneous Subsets (Subsets of Groups, whose highest and lowest means do not differ by more than the shortest significant range for a subject of that size)

APPENDIX 20

SUMMARY TABLE - NEWMAN-KEUL ONEWAY ANALYSIS OF VARIANCE
- CONNECTIVE BY LANGUAGE
Overall Comparison of connectives across tasks.

CONNECTIVE	MARBLE	TOY	E.I.
THEN	2 1 3	1 2 3	N.S
AFTER	2 1 3	1 2 3	2 1 3
WHILE	N.S.	2 1 3	-
WHEN	N.S.	2 1 3	N.S.
BEFORE	N.S.	1 2 3	1 2 3
UNTIL	2 3 1	1 2 2 3	2 3 1
TOGETHER	1 2 2 3	2 1 3	1 2 3
SINCE	-	N.S.	2 1 1 3
Overall language effect	Eng>Thai 2 1 1 3	English is best 2 1 3	Eng>Thai 2 1 1 3

(Lisu=1, Thai=2, English=3 N.S.= not significant, -= not used in this task, >= is significantly better than)

APPENDIX 21

ELICITED IMITATION TASK - SUBSTITUTIONS FOR ENGLISH
the number of substitutions are listed in the columns.

AGE GROUP 1

FORM IN TEST SENTENCE	SUBSTITUTED FORM									
	and	when	(and) then	before	till /until	so	while	after	since	Total
then	32			3			3			38
after	8	3	1		2					14
while	6									6
when	12						5		1	18
before	15	1			7		2			25
until	5	1	2			1	1			13
since	5	1	1	3	1		1	1		11
together	4	1		1						
TOTAL	87	7	4	7	10	1	12	1	1	130

AGE GROUP 2

FORM IN TEST SENTENCE	SUBSTITUTED FORM						
	and	after	while	before	when	then	Total
then	34		2	4	1		41
after	2		2	5	7		16
while		4		1	8		13
when	2	9	7	1			19
before	9		5		5		19
until	8	2	1	5	1	1	18
since		4	3	3	8		18
together			3	1	1		5
TOTAL	55	19	23	20	31	1	149

APPENDIX 21

ELICITED IMITATION TASK - SUBSTITUTIONS FOR ENGLISH

AGE GROUP 3							
FORM IN TEST SENTENCE	SUBSTITUTED FORM						
	and	when	before	while	after	until	Total
then	21	7	10				38
after		13	1	3			17
while		7			1		8
when			5	7	2		14
before	1	3		1	1		6
until	1	5	13	2			21
since		9		3	1		13
together		5		1	1	1	8
TOTAL	23	49	29	17	6	1	125

AGE GROUP 4								
FORM IN TEST SENTENCE	SUBSTITUTED FORM							
	and	while	before	when	after	until	and then	Total
then	21	6	2	4				33
after		1	1	2				4
while	1		1	2	2			6
when		12	1		5			18
before	2	5		1		1	1	10
until	1	8	5				1	15
since		3	3		1			7
together		5						5
TOTAL	25	40	13	9	8	1	2	98

APPENDIX 21

ELICITED IMITATION TASK - SUBSTITUTIONS FOR ENGLISH

OVERALL AGE GROUPS										
FORM IN TEST SENTENCE	SUBSTITUTED FORM									
	and	when	(and) then	before	till /until	so	while	after	since	Total
then	108	12		16			11			38
after	10	25	1	9	2		6			14
while	7	17		9				7		6
when	14			6			31	16	1	18
before	37	10	1		8		13	1		25
until	11	7	4	22		1	12	2		13
since	5	18	1	12	1		10	7		11
together	4	7		1	1		9	1		5
TOTAL	196	96	7	75	12	1	102	34	1	130

ELICITED IMITATION TASK - SUBSTITUTIONS FOR LISU
the number of substitutions are listed in the columns.

ELICITED IMITATION TASK - SUBSTITUTIONS FOR LISU
AGE GROUP 1

FORM IN TEST SENTENCE	'atiga then	SUBSTITUTED FORM when	before	after	since	'bia' then	while	Total
then'atiga'		4						4
when						1		0
before		7				1		7
after	1	4						5
since		1				1		1
then'bia'		1						1
TOTAL	1	17	0	0	0	3	0	21

AGE GROUP 2

FORM IN TEST SENTENCE	'atiga then	SUBSTITUTED FORM when	before	after	since	'bia' then	while	Total
then'atiga'		2		1		8		11
when	1		2			3		6
before	1	5			1	4		11
after	1				3	3		7
since			1	1		1		3
then'bia'		3						3
TOTAL	3	10	3	2	4	19	0	41

APPENDIX 22

ELICITED IMITATION TASK - SUBSTITUTIONS FOR LISU

AGE GROUP 3								
FORM IN TEST SENTENCE	'atiga' then	SUBSTITUTED FORM when	before	after	since	'bia' then	while	Total
then'atiga'		1		1				2
when				3		1		3
before		2		2		4	2	10
after						2		2
since						1		1
then'bia'								0
TOTAL		3	0	6	0	8	0	18

ELICITED IMITATION TASK - SUBSTITUTIONS FOR LISU AGE GROUP 4								
FORM IN TEST SENTENCE	'atiga' then	SUBSTITUTED FORM when	before	after	since	'bia' then	while	Total
then'atiga'		4		1	1	4		10
when						1		1
before		5		2		1	1	9
after		1				3		4
since			1	4				5
then'bia		4						4
TOTAL		14	1	7	1	9	0	33

APPENDIX 22

ELICITED IMITATION TASK - SUBSTITUTIONS FOR LISU

OVERALL AGE GROUPS								
FORM IN TEST SENTENCE	'atiga' then	SUBSTITUTED FORM when	before	after	since	'bia' then	while	Total
then'atiga'	0	11	0	3	1	28		43
when	1	0	2	3		6		12
before	1	19	0	4	1	10	3	38
after	2	5	0		3	8		18
since	0	1	2	5		3		11
then'bia'	0	8	0					8
TOTAL	4	44	4	15	5	65	3	222

APPENDIX 23

ELICITED IMITATION TASK - SUBSTITUTIONS FOR THAI
the number of substitutions are listed in the columns

ELICITED IMITATION TASK - SUBSTITUTIONS FOR THAI OVERALL AGE GROUPS									
FORM IN TEST SENTENCE	SUBSTITUTED FORM then	when	before	after	since	and	until	already	Total
then		3	3			5			11
when						2		1	3
before		1		1		1		1	4
after		14	1		2	1	1		19
since		8							8
while	1	10			1	1			13
until						1			3
Total	1	36	4	1	3	11	1	4	61

APPENDIX 24

MARBLE TASK - TYPES OF ERRORS

TABLE A24.1
NUMBER OF SEQUENTIAL RESPONSES MADE TO "WHEN" SENTENCES

	LISU	THAI	ENGLISH
AGE GROUP 1	38	17	23
AGE GROUP 2	31	14	18
AGE GROUP 3	18	15	11
AGE GROUP 4	9	5	1
TOTAL	96	51	53

(Each Age group for language has a maximum score of 60)

TABLE A24.2
NUMBER OF ERROR RESPONSES MADE TO "WHILE" SENTENCES

TYPE OF RESPONSE	LISU		THAI		ENGLISH	
	'when'	sequent -ial	'when'	sequent -ial	'when'	sequent -ial
AGE GROUP 1	15	37	23	16	16	33
AGE GROUP 2	16	22	21	16	18	22
AGE GROUP 3	19	6	15	14	23	11
AGE GROUP 4	10	0	10	4	10	0
TOTAL	60	65	69	50	57	66

(Each Age group for language has a maximum score out of 60)
(AGE GROUP 1 - 3;7-4;6 years, AGE GROUP 2 - 4;7-5;6 years,
AGE GROUP 3 - 5;7-6;6, AGE GROUP 4 - 6;7-7;6 years)

APPENDIX 25

TOY TASK - TYPES OF ERRORS

TABLE A25.1
NUMBER OF SEQUENTIAL RESPONSES MADE TO "WHEN" AND "WHILE" SENTENCES

	LISU		THAI		ENGLISH	
	WHEN	WHILE	WHEN	WHILE	WHEN	WHILE
AGE GROUP 1	19	15	17	10	13	4
AGE GROUP 2	18	10	20	8	13	6
AGE GROUP 3	27	13	44	17	21	3
AGE GROUP 4	10	4	56	28	14	1
TOTAL	74	42	137	63	61	14

(Each Age group for language score is out of a maximum of 60)

TABLE A25.2
NUMBER OF ERRORS FOR DIFFERENT TYPES OF "WHILE" SENTENCES

	LISU			THAI			ENGLISH		
	CP/P	P/CP	CP/CP	CP/P	P/CP	CP/CP	CP/P	P/CP	CP/CP
AGE GROUP 1	13	14	19	14	11	17	5	2	7
AGE GROUP 2	8	5	12	11	6	17	7	5	7
AGE GROUP 3	11	4	11	5	1	20	2	0	2
AGE GROUP 4	3	0	3	8	0	15	3	0	1
TOTAL	35	23	45	38	18	69	17	7	17

(CP=Culminated Process expression, P=Process expression)
(Each Age group cell has a maximum score of 20)

TABLE A25.3
NUMBER OF ERRORS FOR DIFFERENT TYPES OF "SINCE" SENTENCES

	LISU		THAI		ENGLISH	
	P/CP	CP/P	P/CP	CP\P	P/CP	CP/P
AGE GROUP 1	18	29	19	26	14	25
AGE GROUP 2	11	28	3	30	15	27
AGE GROUP 3	2	21	0	28	2	20
AGE GROUP 4	2	22	0	17	1	20
TOTAL	33	100	22	101	32	92

(P=Process expression, CP=Culminated Process expression)
Type A Sentence = CP/P, Type B Sentence = P/CP
(Each Age group cell has a maximum score of 30)

TABLE A25.4
MAIN TYPE OF ERROR FOR "SINCE" SENTENCES - A SENTENCE WITH A CULMINATED PROCESS (CP) FOLLOWED BY A PROCESS (P) IS RESPONDED TO WITH THE PROCESS THEN THE CULMINATED PROCESS RESPONSE

	LISU CP/P->P/CP	THAI CP/P->P/CP	ENGLISH CP/P->P/CP
AGE GROUP 1	8	11	17
AGE GROUP 2	13	17	14
AGE GROUP 3	17	24	15
AGE GROUP 4	21	8	20
TOTAL	59	60	67

(Each Age group for language score is out of a maximum of 60)

TABLE A25.5
NUMBER OF ERRORS FOR DIFFERENT TYPES OF "UNTIL" SENTENCES

	LISU		THAI		ENGLISH	
	P/CP	CP/P	P/CP	CP\P	P/CP	CP/P
AGE GROUP 1	25	20	21	17	13	7
AGE GROUP 2	19	14	14	10	7	7
AGE GROUP 3	9	8	10	2	9	0
AGE GROUP 4	5	4	1	2	2	0
TOTAL	28	49	46	21	31	14

(P=Process expression, CP=Culminated Process expression)
Type C Sentence = P/CP, Type D Sentence = CP/P
(Each cell has a maximum of 30)
(AGE GROUP 1 - 3;7-4;6 years, AGE GROUP 2 - 4;7-5;6 years, AGE GROUP 3 - 5;7-6;6, AGE GROUP 4 - 6;7-7;6 years)

APPENDIX 26

DIFFERENT TYPES OF ERROR RESPONSES TO THE E.I. TASK
(the actual number recorded is given)
(AGE GROUP 1 - 3;7-4;6 years, AGE GROUP 2 - 4;7-5;6 years,
AGE GROUP 3 - 5;7-6;6, AGE GROUP 4 - 6;7-7;6 years)

(1) ONE CLAUSE ONLY

	LISU ONE CLAUSE	THAI ONE CLAUSE	ENGLISH ONE CLAUSE
AGE GROUP 1	187	176	86
AGE GROUP 2	43	113	16
AGE GROUP 3	13	48	8
AGE GROUP 4	12	33	0
TOTAL	255	370	110

(Each Age group cell has a maximum score of 480)

(2) ONE CLAUSE, VERB AND OBJECT ONLY

	LISU V+O ONLY	THAI V+O ONLY	ENGLISH V+O ONLY
AGE GROUP 1	80	53	5
AGE GROUP 2	4	31	0
AGE GROUP 3	2	4	0
AGE GROUP 4	1	0	0
TOTAL	87	88	5

(Each Age group cell has a maximum score of 480)

(3) TWO CLAUSES, NO CONNECTIVE

	LISU NO CONNECTIVE	THAI NO CONNECTIVE	ENGLISH NO CONNECTIVE
AGE GROUP 1	21	73	37
AGE GROUP 2	37	144	124
AGE GROUP 3	103	188	124
AGE GROUP 4	46	141	95
TOTAL	207	546	380

(Each Age group cell has a maximum of 480)

APPENDIX 26

(AGE GROUP 1 - 3;7-4;6 years, AGE GROUP 2 - 4;7-5;6 years, AGE GROUP 3 - 5;7-6;6, AGE GROUP 4 - 6;7-7;6 years)
Each Age group cell has a maximum score of 480
(4) TWO CLAUSES, NO SUBJECT

	LISU NO SUBJECT	THAI NO SUBJECT	ENGLISH NO SUBJECT
AGE GROUP 1	32	6	0
AGE GROUP 2	18	2	0
AGE GROUP 3	18	0	0
AGE GROUP 4	4	0	0
TOTAL	72	8	0

(5) TWO CLAUSES, ONE SUBJECT ONLY

	LISU ONE SUBJECT	THAI ONE SUBJECT	ENGLISH ONE SUBJECT
AGE GROUP 1	123	15	5
AGE GROUP 2	143	9	22
AGE GROUP 3	106	2	6
AGE GROUP 4	91	1	9
TOTAL	463	27	42

(6) VERB REPLICATED, I.E. VERB IS THE SAME IN BOTH CLAUSES

	LISU VERB SAME	THAI VERB SAME	ENGLISH VERB SAME
AGE GROUP 1	1	0	31
AGE GROUP 2	1	0	58
AGE GROUP 3	0	0	15
AGE GROUP 4	0	0	20
TOTAL	2	0	124

APPENDIX 26

(AGE GROUP 1 - 3;7-4;6 years, AGE GROUP 2 - 4;7-5;6 years, AGE GROUP 3 - 5;7-6;6, AGE GROUP 4 - 6;7-7;6 years)

(7) OBJECT REPLICATED, I.E. OBJECT IS THE SAME IN BOTH CLAUSES

	LISU OBJECT SAME	THAI OBJECT SAME	ENGLISH OBJECT SAME
AGE GROUP 1	0	0	4
AGE GROUP 2	0	0	5
AGE GROUP 3	0	0	2
AGE GROUP 4	0	0	3
TOTAL	0	0	14

(8) PROGRESSIVE ASPECT MARKER OMITTED

	LISU -ASPECT	THAI -ASPECT	ENGLISH -ASPECT
AGE GROUP 1	4	56	12
AGE GROUP 2	6	28	7
AGE GROUP 3	11	23	12
AGE GROUP 4	6	25	4
TOTAL	26	132	35